

INSTALLATION INSTRUCTIONS

R-410A Single Package Rooftop Electric Cooling

RAH110/120

These instructions must be read and understood completely before attempting installation

Safety Labeling and Signal Words

DANGER, WARNING, CAUTION, and NOTE

The signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING**, **CAUTION**, and **NOTE** will be used on product labels and throughout this manual and other manual that may apply to the product.

DANGER – Immediate hazards which will result in severe personal injury or death.

WARNING – Hazards or unsafe practices which could result in severe personal injury or death.

CAUTION – Hazards or unsafe practices which may result in minor personal injury or product or property damage.

NOTE – Used to highlight suggestions which will result in enhanced installation, reliability, or operation.

Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:

 **WARNING**

The signal word **CAUTION** is used throughout this manual in the following manner:

 **CAUTION**

Signal Words on Product Labeling

Signal words are used in combination with colors and/or pictures or product labels.

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 **WARNING**

PERSONAL INJURY, AND/OR PROPERTY DAMAGE HAZARD

Failure to carefully read and follow this warning could result in equipment malfunction, property damage, personal injury and/or death.

Installation or repairs made by unqualified persons could result in equipment malfunction, property damage, personal injury and/or death.

The information contained in this manual is intended for use by a qualified service technician familiar with safety procedures and equipped with proper tools and test instruments.

Installation must conform with local building codes and with the national Electrical Code NFPA70 current edition or Canadian Electrical Code part 1 CSA C.22.1.


IMPORTANT – READ BEFORE INSTALLING

1. Read and become familiar with these installation instructions before installing this unit.
2. Be sure the installation conforms to all applicable local and national codes.
3. These instructions contain important information for the proper maintenance and repair of this equipment. Retain these instructions for future use.

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock or other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloths for brazing operations and have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and appropriate national electrical codes (in USA, ANSI/NFPA70, National Electrical Code (NEC); in Canada, CSA C22.1) for special requirements.

Recognize safety information. This is the safety-alert symbol . When you see this symbol in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE**. These words are used with the safety-alert symbol. **DANGER** identifies the most serious hazards which **will** result in serious injury or death. **WARNING** signifies a hazard which **could** result in serious injury or death. **CAUTION** is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. **NOTE** is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

These instructions cover minimum requirements and conform to existing national standards and safety codes. In some instances, these instructions exceed certain local codes and ordinances, especially those that may not have kept up with

changing residential construction practices. We require these instructions as a minimum for a safe installation.



WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could cause personal injury or death.

Before performing service or maintenance operations on unit, turn off main power switch to unit and install lockout tag. Ensure electrical service to rooftop unit agrees with voltage and amperage listed on the unit rating plate. Unit may have more than one power switch.



WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could cause personal injury, death and/or equipment damage.

R-410A refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on R-410A refrigerant equipment.



WARNING

PERSONAL INJURY AND ENVIRONMENTAL HAZARD

Failure to follow this warning could cause personal injury, and/or death.

Relieve pressure and recover all refrigerant before system repair or final unit disposal.

Wear safety glasses and gloves when handling refrigerants. Keep torches and other ignition sources away from refrigerants and oils.



CAUTION



CUT HAZARD

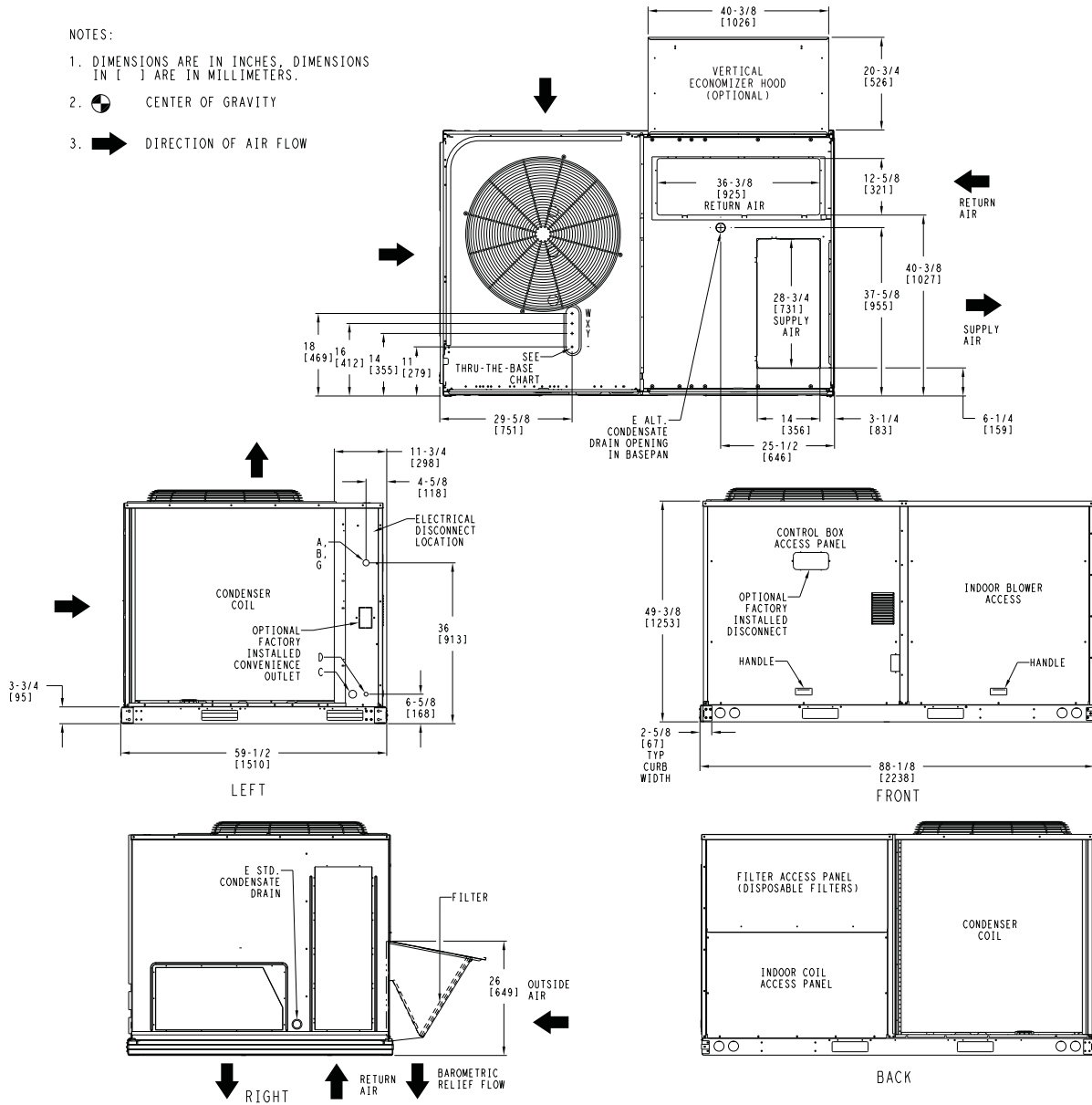
Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing units.

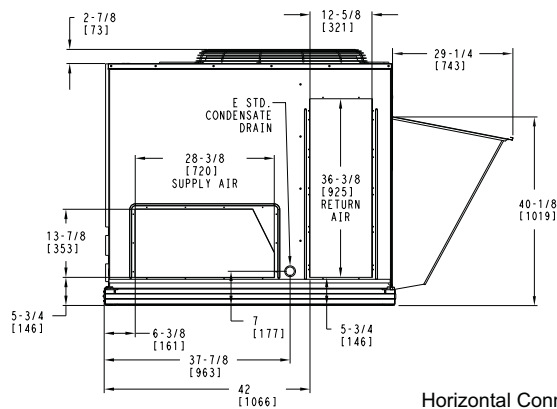
FIGURE 1 Base Unit Dimensions: RAH110/120

NOTES:

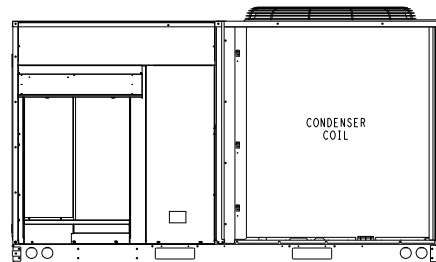
1. DIMENSIONS ARE IN INCHES. DIMENSIONS IN [] ARE IN MILLIMETERS.
2.  CENTER OF GRAVITY
3.  DIRECTION OF AIR FLOW



Vertical Connections / Economizer



Horizontal Connections / Economizer



CONNECTION SIZES	
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2 1/2" [64] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [51] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
G	2" [51] DIA POWER SUPPLY KNOCK-OUT

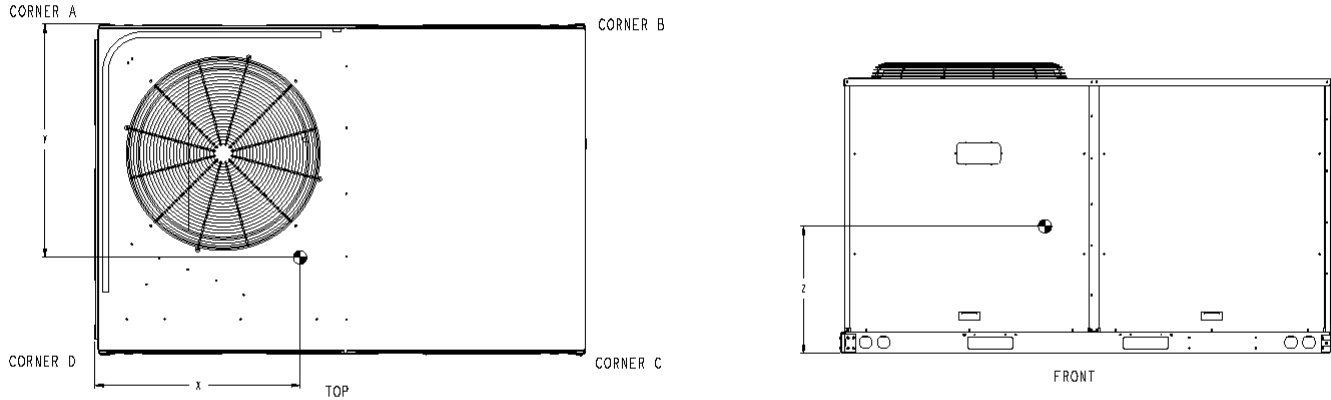
THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPWR002A01			
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y	1 1/4" [002]	POWER	1 3/4" [44.4]
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X & Y ARE PROVIDED			

Figure 1A

Base Unit Dimensions and Weight: RAH110/120

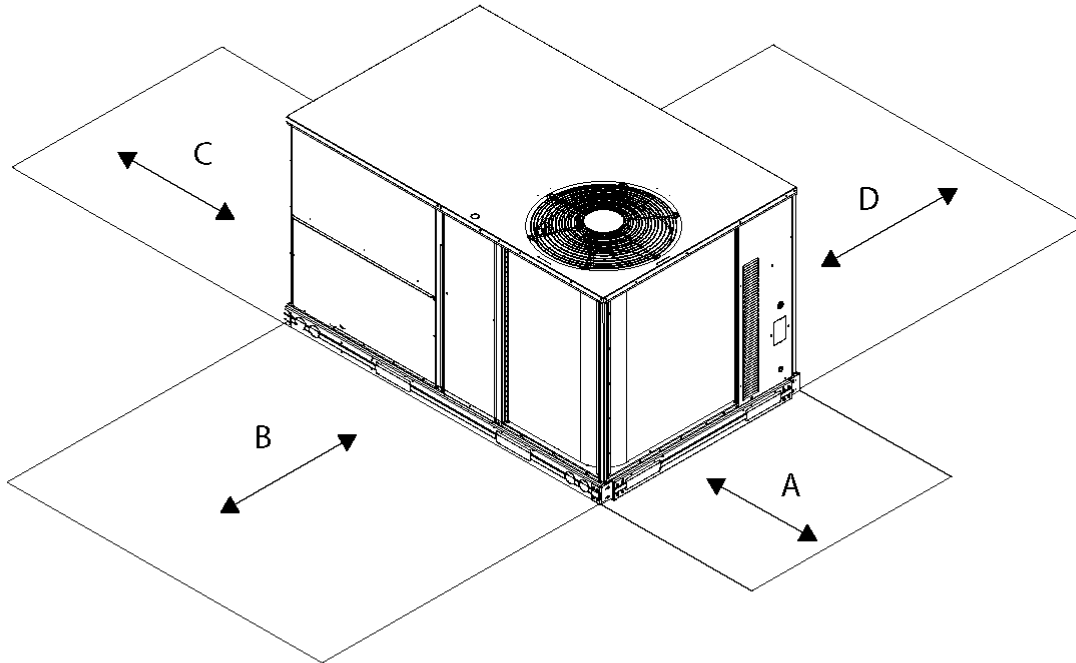
UNIT	STD. UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
RAH110	1025	466	308	140	146	66	184	84	387	176	28 3/8 [721]	33 1/8 [841]	21 3/8 [543]
RAH120	1025	466	308	140	146	66	184	84	387	176	28 3/8 [721]	33 1/8 [841]	21 3/8 [543]

* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



C13064

FIGURE 2 SERVICE CLEARANCE DRAWING



C08337

LOCATION	DIMENSION	CONDITION
A	48- in (1219 mm) 18- in (457 mm) 18- in (457 mm) 12- in (305 mm)	Unit disconnect is mounted on panel No disconnect, convenience outlet option Recommended service clearance Minimum clearance
B	42- in (1067 mm) 36- in (914 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall) Surface behind servicer is electrically non- conductive (e.g., wood, fiberglass)
C	36- in (914 mm) 18- in (457 mm)	Side condensate drain is used Minimum clearance
D	42- in (1067 mm) 36- in (914 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit) Surface behind servicer is electrically non- conductive (e.g., wood, fiberglass)

NOTE: Unit not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or for vertical clearances.

INSTALLATION

Jobsite Survey

Complete the following checks before installation.

1. Consult local building codes and the NEC (National Electrical Code) ANSI/NFPA 70 for special installation requirements.
2. Determine unit location (from project plans) or select unit location.
3. Check for possible overhead obstructions which may interfere with unit lifting or rigging.

Step 1 — Plan for Unit Location

Select a location for the unit and its support system (curb or other) that provides for the minimum clearances required for safety. This includes the clearance to combustible surfaces, unit performance and service access below, around and above unit as specified in unit drawings. See Fig. 2.

NOTE: Consider also the effect of adjacent units.

Unit may be installed directly on wood flooring or on Class A, B, or C roof-covering material when roof curb is used.

Do not install unit in an indoor location. Do not locate air inlets near exhaust vents or other sources of contaminated air.

Although unit is weatherproof, avoid locations that permit water from higher level runoff and overhangs to fall onto the unit.

Select a unit mounting system that provides adequate height to allow installation of condensate trap per requirements. Refer to Step 9 — Install External Condensate Trap and Line — for required trap dimensions.

Roof mount —

Check building codes for weight distribution requirements. Unit operating weight is shown in Table 1.

Step 2 — Plan for Sequence of Unit Installation

The support method used for this unit will dictate different sequences for the steps of unit installation. For example, on curb-mounted units, some accessories must be installed on the unit before the unit is placed on the curb. Review the following for recommended sequences for installation steps.

Curb-mounted installation —

- Install roof curb
- Install field-fabricated ductwork inside curb
- Install accessory thru-base service connection package, if used, (affects curb and unit) (refer to accessory installation instructions for details)
- Prepare condensate drain connection to suit planned condensate line routing (refer to Step 9 for details)
- Rig and place unit
- Install outdoor air hood
- Install condensate line trap and piping
- Make electrical connections
- Install other accessories

Table 1—Operating Weights

RAH110/120	UNITS LB (KG)
Base Unit	1025 (465)
Economizer	
Vertical	80 (36)
Horizontal	105 (48)
Hot Gas Reheat	75 (34)
Curb	
14-in/356 mm	133 (60)
24-in/610 mm	174 (79)

Pad-mounted installation —

- Prepare pad and unit supports
- Check and tighten the bottom condensate drain connection plug
- Rig and place unit
- Install outdoor air hood
- Convert unit to side duct connection arrangement
- Install field-fabricated ductwork at unit duct openings
- Install outdoor hood
- Install condensate line trap and piping
- Make electrical connections
- Install other accessories

Frame-mounted installation —

Frame-mounted applications generally follow the sequence for a curb installation. Adapt as required to suit specific installation plan.

Step 3 — Inspect unit

Inspect unit for transportation damage. File any claim with transportation agency.

Confirm before installation of unit that voltage, amperage and circuit protection requirements listed on unit data plate agree with power supply provided.

On units with hinged panel option, check to be sure all latches are snug and in closed position.

Locate the carton containing the outside air hood parts; see Fig. 8. Do not remove carton until unit has been rigged and located in final position.

Step 4 — Provide Unit Support

Roof Curb Mount —

Accessory roof curb details and dimensions are shown in Fig. 4. Assemble and install accessory roof curb in accordance with instructions shipped with the curb.

NOTE: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket supplied with the roof curb as shown in Fig. 4. Improperly applied gasket can also result in air leaks and poor unit performance.

Curb should be level. This is necessary for unit drain to function properly. Unit leveling tolerances are shown in Fig. 3. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

Install insulation, cant strips, roofing felt, and counter flashing as shown. *Ductwork must be attached to curb and not to the*

unit. The accessory thru-the-base power and gas connection package must be installed before the unit is set on the roof curb.

If electric and control wiring is to be routed through the basepan, attach the accessory thru-the-base service connections to the basepan in accordance with the accessory installation instructions.

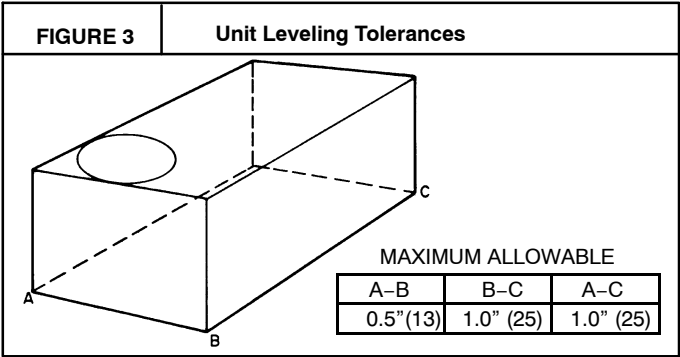
Slab Mount (Horizontal Units Only) —

Provide a level concrete slab that extends a minimum of 6 in. (150 mm) beyond unit cabinet. Install a gravel apron in front of condenser coil air inlet to prevent grass and foliage from obstructing airflow.

NOTE:Horizontal units may be installed on a roof curb if required.

Alternate Unit Support (In Lieu of Curb or Slab Mount) —

A non-combustible sleeper rail can be used in the unit curb support area. If sleeper rails cannot be used, support the long sides of the unit with a minimum of 3 equally spaced 4-in. x 4-in. (102 mm x 102 mm) pads on each side.



Step 5 — Field Fabricate Ductwork

Cabinet return-air static pressure (a negative condition) shall not exceed 0.35 in. wg (87 Pa) with economizer or 0.45 in. wg (112 Pa) without economizer.

For vertical ducted applications, secure all ducts to roof curb and building structure. *Do not connect ductwork to unit.*

Fabricate supply ductwork so that the cross sectional dimensions are equal to or greater than the unit supply duct opening dimensions for the first 18 in. (458 mm) of duct length from the unit basepan.

Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

Ducts passing through unconditioned spaces must be insulated and covered with a vapor barrier.

If a plenum return is used on a vertical unit, the return should be ducted through the roof deck to comply with applicable fire codes.

⚠ CAUTION

PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in damage to roofing materials.

Membrane roofs can be cut by sharp sheet metal edges. Be careful when placing any sheet metal parts on such roof.

For units with accessory electric heaters:

All installations require a minimum clearance to combustible surfaces of 1-in (25 mm) from duct for first 12-in (305 mm) away from unit.

Outlet grilles must not lie directly below unit discharge.
NOTE: A 90-degree elbow must be provided in the ductwork to comply with UL (Underwriters Laboratories) code for use with electric heat.

⚠ WARNING

PERSONAL INJURY HAZARD

Failure to follow this warning could cause personal injury.
For vertical supply and return units, tools or parts could drop into ductwork and cause an injury. Install a 90-degree turn in the return ductwork between the unit and the conditioned space. If a 90-degree elbow cannot be installed, then a grille of sufficient strength and density should be installed to prevent objects from falling into the conditioned space. Due to electric heater, supply duct will require 90-degree elbow.

Step 6 — Rig and Place Unit

Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. See Table 1 and Fig. 5 for additional information.
Lifting holes are provided in base rails as shown in Fig. 5. Refer to rigging instructions on unit.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.
All panels must be in place when rigging. Unit is not designed for handling by fork truck.

Before setting the unit onto the curb, recheck gasketing on curb.

Roof Curb Details

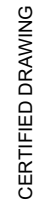
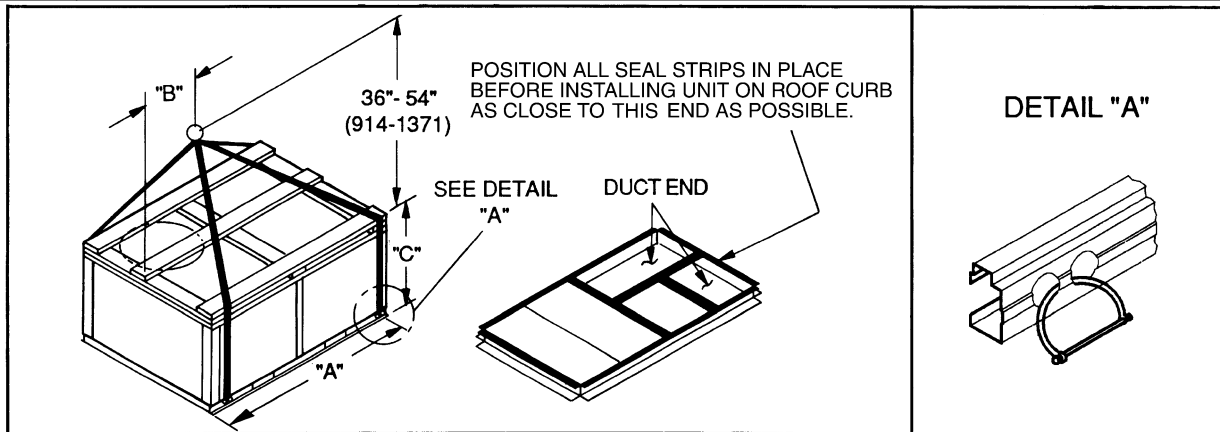


FIGURE 5

Rigging Details



NOTES:

1. Dimensions in () are in millimeters.
2. Hook rigging shackles through holes in base rail, as shown in detail "A." Holes in base rails are centered around the unit center of gravity. Use wooden top skid when rigging to prevent rigging straps from damaging unit.

3. Unit weights do not include economizer. See Table 1 for economizer weights.

Table 2—Unit Weights

UNIT	MAX WEIGHT		DIMENSIONS					
			A		B		C	
	LB	KG	IN	MM	IN	MM	IN	MM
RAH110/120	1580	718	88.0	2235	31.5	775	49.5	1255

NOTES:

1. Dimensions in () are in millimeters.
2. Hook rigging shackles through holes in base rail, as shown in detail "A." Holes in base rails are centered around the unit center of gravity. Use wooden top to prevent rigging straps from damaging unit.

Positioning on Curb

Position unit on roof curb so that the following clearances are maintained: 1/4 in. (6.4 mm) clearance between the roof curb and the base rail inside the front and rear, 0.0 in. clearance between the roof curb and the base rail inside on the duct end of the unit. This will result in the distance between the roof curb and the base rail inside on the condenser end of the unit being 3–5/16 inches (84mm).

Although unit is weatherproof, guard against water from higher level runoff and overhangs.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

All panels must be in place when rigging. Unit is not designed for handling by fork truck.

After unit is in position, remove rigging skids and shipping materials.

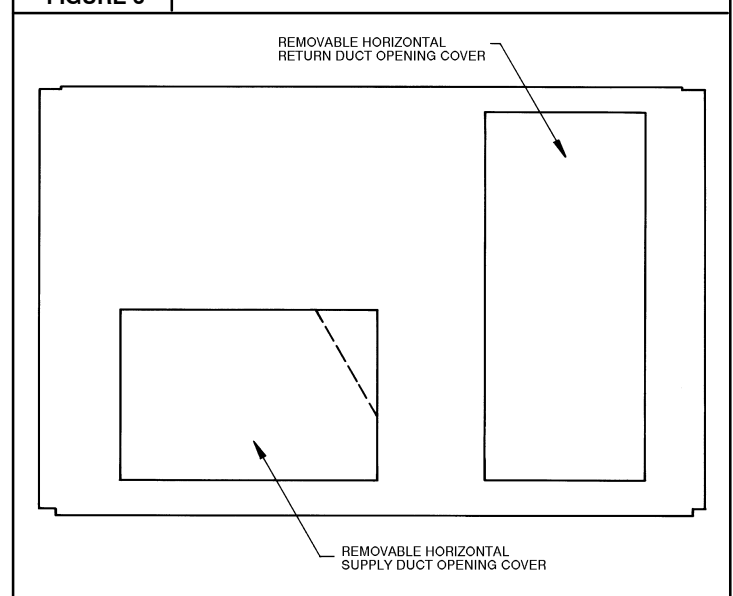
Step 7 — Convert to Horizontal and Connect Ductwork (when required)

Unit is shipped in the vertical duct configuration. Unit *without* factory-installed economizer or return air smoke detector option may be field-converted to horizontal ducted

configuration. To convert to horizontal configuration, remove screws from side duct opening covers and remove covers. Using the same screws, install covers on vertical duct openings with the insulation—side down. Seals around duct openings must be tight. See Fig. 6.

FIGURE 6

HORIZONTAL CONVERSION PANELS

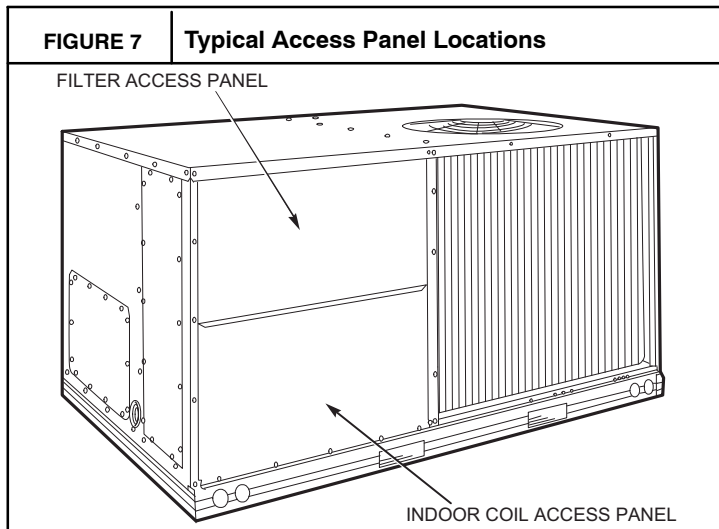


Field-supplied flanges should be attached to horizontal duct openings and all ductwork should be secured to the flanges. Insulate and weatherproof all external ductwork, joints, and roof or building openings with counter flashing and mastic in accordance with applicable codes.

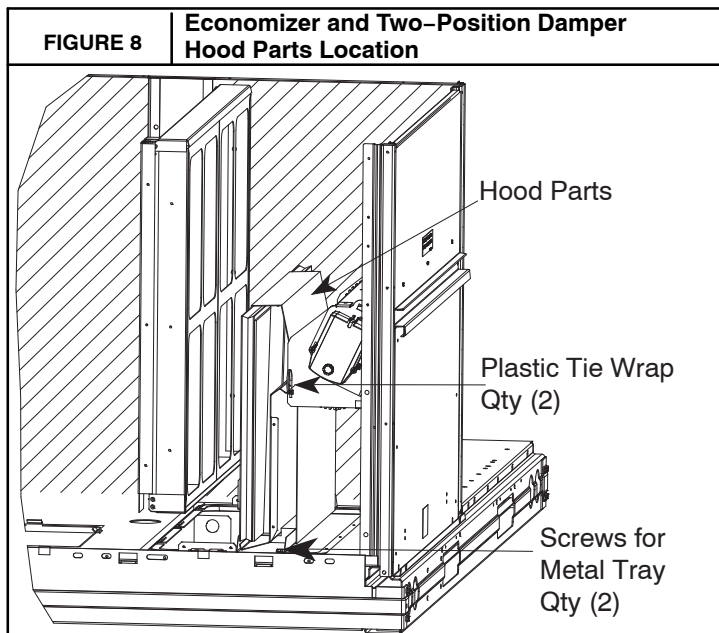
Do not cover or obscure visibility to the unit's informative data plate when insulating horizontal ductwork.

Step 8 — Install Optional Outside Air Hood

1. The hood is shipped in knock-down form and located in the return air compartment. The indoor coil access panel is used as the hood top while the hood sides, divider and filter are packaged together, attached to a metal support tray using plastic stretch wrap, and shipped in the return air compartment behind the indoor coil access panel. The hood assembly's metal tray is attached to the basepan and also attached to the damper using two plastic tie-wraps.
2. To gain access to the hood, remove the filter access panel. (See Fig. 7.)



3. Locate the (2) screws holding the metal tray to the basepan and remove. Locate and cut the (2) plastic tie-wraps, being careful to not damage any wiring. (See Fig. 8.)

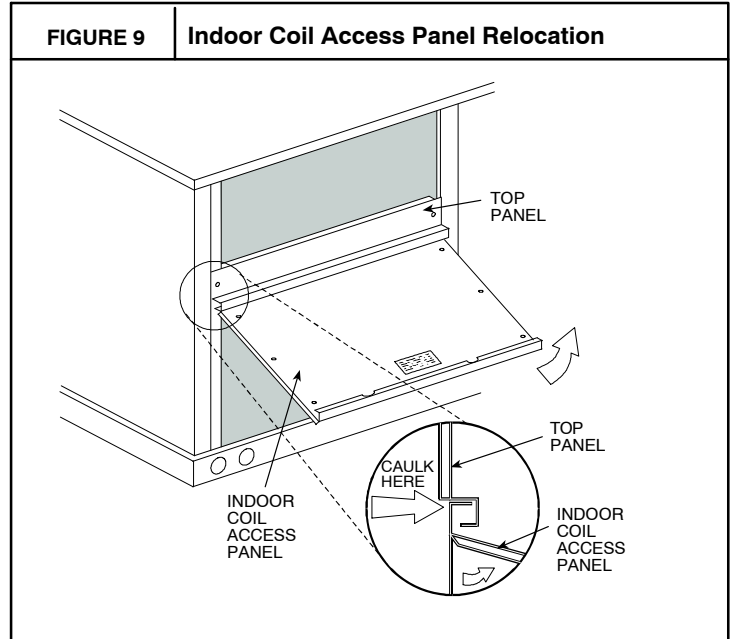


4. Carefully lift the hood assembly through the filter access opening and assemble per the steps outlined in Economizer Hood and Two-Position Hood.

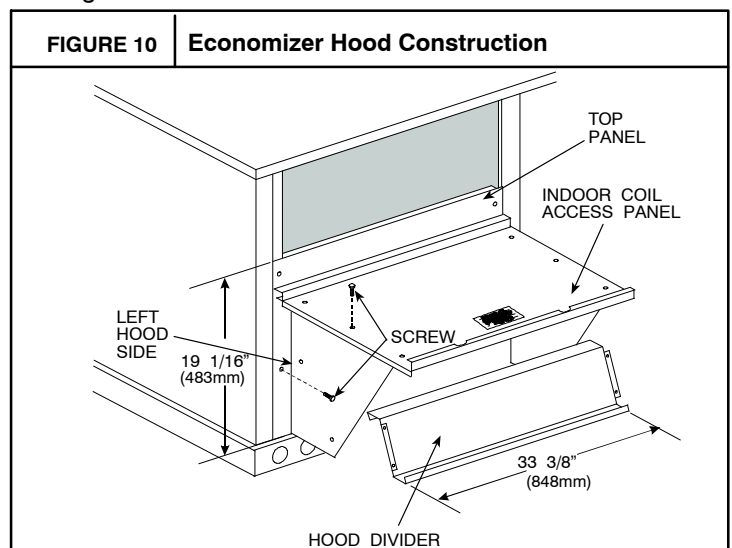
Economizer Hood and Two-Position Hood

NOTE: If the power exhaust accessory is to be installed on the unit, the hood shipped with the unit will not be used and must be discarded. Save the aluminum filter for use in the power exhaust hood assembly.

1. The indoor coil access panel will be used as the top of the hood. Remove the screws along the sides and bottom of the indoor coil access panel. (See Fig. 9.)



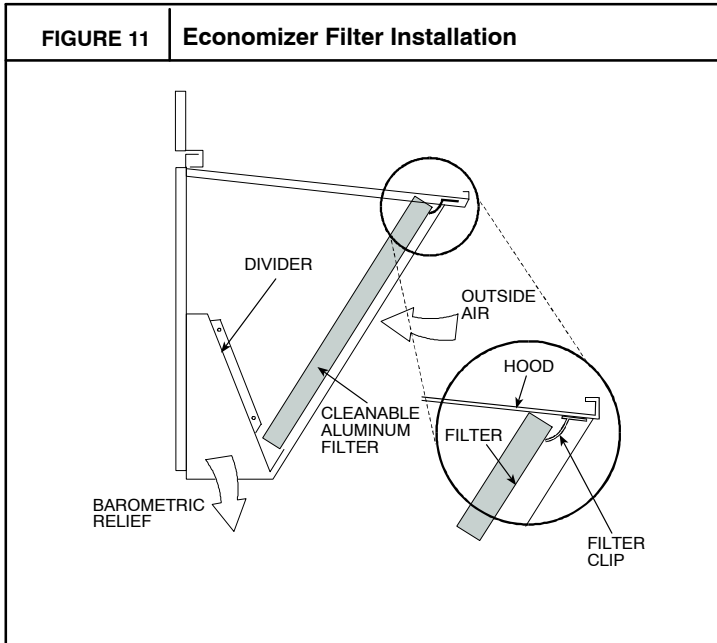
2. Swing out indoor coil access panel and insert the hood sides under the panel (hood top). Use the screws provided to attach the hood sides to the hood top. Use screws provided to attach the hood sides to the unit. (See Fig. 10.)



3. Remove the shipping tape holding the economizer barometric relief damper in place.
4. Insert the hood divider between the hood sides. (See Fig. 10 and 11.) Secure hood divider with 2 screws on each

hood side. The hood divider is also used as the bottom filter rack for the aluminum filter.

5. Open the filter clips which are located underneath the hood top. Insert the aluminum filter into the bottom filter rack (hood divider). Push the filter into position past the open filter clips. Close the filter clips to lock the filter into place. See Fig. 11.
6. Caulk the ends of the joint between the unit top panel and the hood top.
7. Replace the filter access panel.

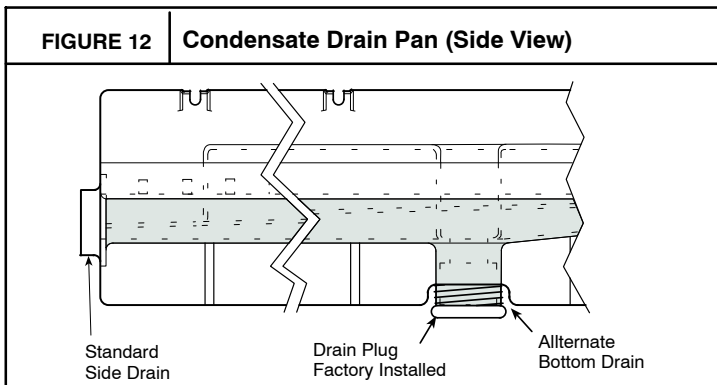


Step 9 — Install External Condensate Trap and Line

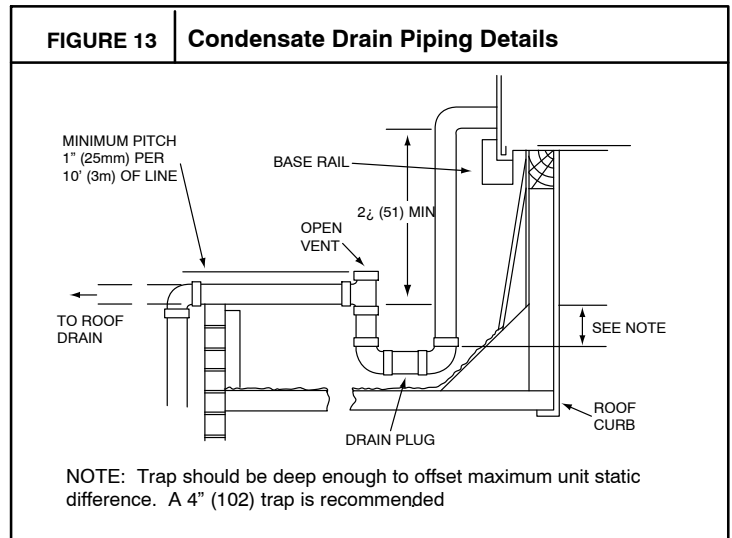
The unit has one $\frac{3}{4}$ -in. condensate drain connection on the end of the condensate pan and an alternate connection on the bottom. See Fig. 12. Unit airflow configuration does not determine which drain connection to use. Either drain connection can be used with vertical or horizontal applications.

When using the standard side drain connection, ensure the red plug in the alternate bottom connection is tight. Do this before setting the unit in place. The red drain pan can be tightened with a $\frac{1}{2}$ -in. square socket drive extension.

To use the alternate bottom drain connection, remove the red drain plug from the bottom connection (use a $\frac{1}{2}$ -in. square socket drive extension) and install it in the side drain connection.



The piping for the condensate drain and external trap can be completed after the unit is in place. See Fig. 13.



All units must have an external trap for condensate drainage. Install a trap at least 4-in. (102 mm) deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1-in. per 10 ft (25 mm in 3 m) of run. Do not use a pipe size smaller than the unit connection ($\frac{3}{4}$ -in.).

Step 10 — Make Electrical Connections

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Do not use gas piping as an electrical ground. Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code); ANSI/NFPA 70, latest edition (in Canada, Canadian Electrical Code CSA [Canadian Standards Association] C22.1), and local electrical codes.

NOTE: Check all factory and field electrical connections for tightness. Field-supplied wiring shall conform with the limitations of 63°F (33°C) rise.


Field Power Supply —

Field power wires are connected to the unit at line-side pressure lugs on compressor contactor C and indoor fan contactor IFC (see wiring diagram label for control box component arrangement) or at factory-installed option non-fused disconnect switch. Max wire size is #2 AWG (copper only).

All units except 208/230-v units are factory wired for the voltage shown on the nameplate. If the 208/230-v unit is to be connected to a 208-v power supply, the control transformer must be rewired by moving the black wire with the $\frac{1}{4}$ -in. female spade connector from the 230-v connection and moving it to the 200-v $\frac{1}{4}$ -in. male terminal on the primary side of the transformer. Refer to unit label

diagram for additional information. Field power wires will be connected line-side pressure lugs on the power terminal block or at factory-installed option non-fused disconnect.

NOTE:TEST LEADS – Unit may be equipped with short leads (pigtails) on the field line connection points on contactor C or optional disconnect switch. These leads are for factory run-test purposes only; remove and discard before connecting field power wires to unit connection points. Make field power connections directly to line connection pressure lugs only.

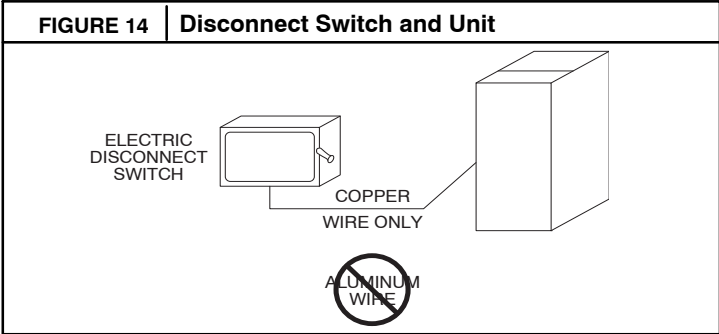


WARNING

FIRE HAZARD

Failure to follow this warning could result in personal injury or death.

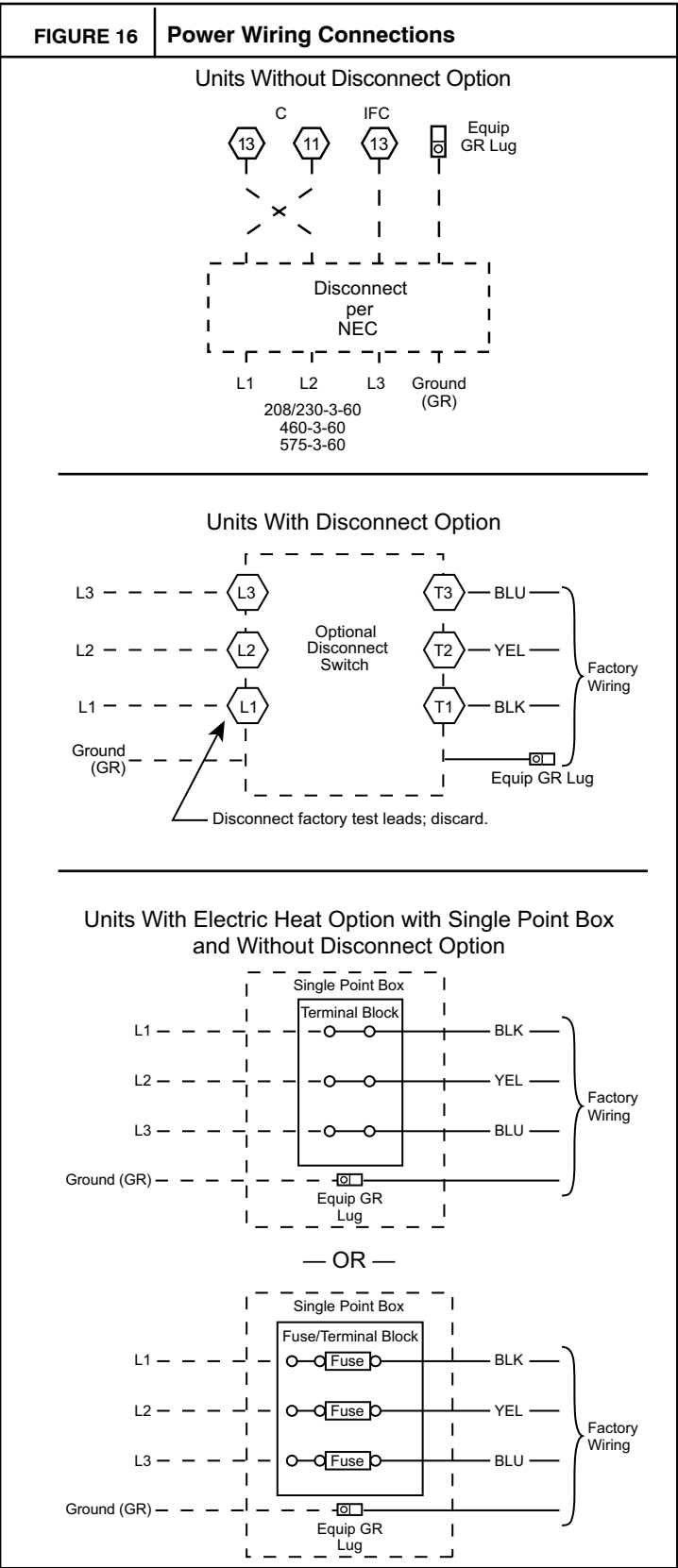
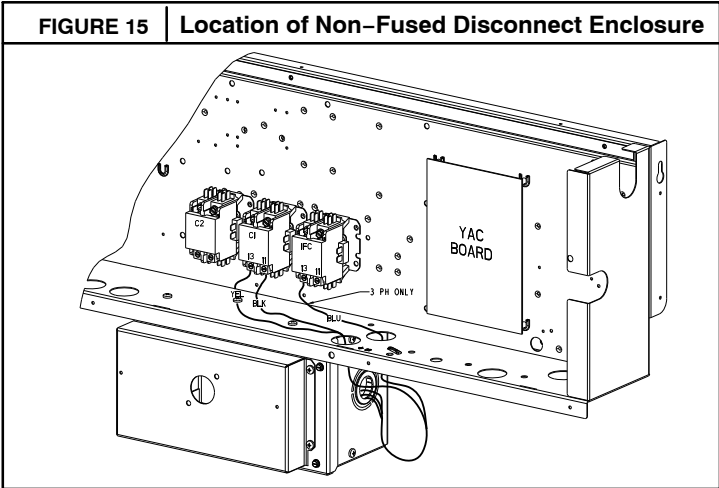
Do not connect aluminum wire between disconnect switch and RAH unit. Use only copper wire.



Units Without Factory-Installed Non-Fused Disconnect

The factory-installed option non-fused disconnect (NFD) switch is located in a weatherproof enclosure located under the main control box (see Fig. 15). The manual switch handle and shaft are shipped in the disconnect enclosure. Assemble the shaft and handle to the switch at this point. Discard the factory test leads (see Fig. 16).

Connect field power supply conductors to LINE side terminals when the switch enclosure cover is removed to attach the handle.

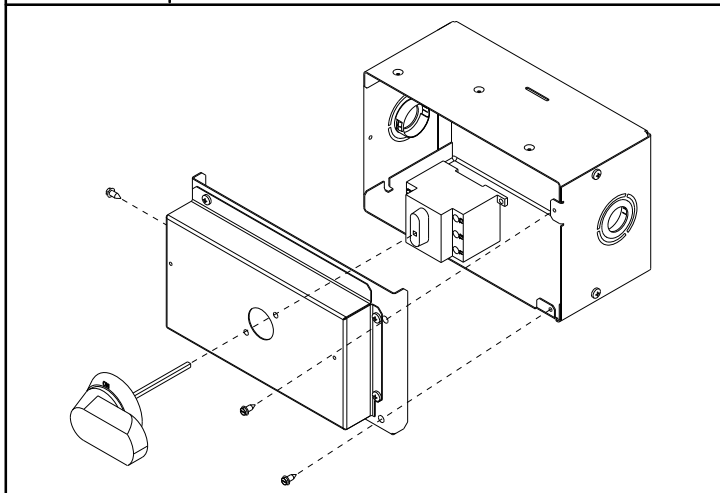


To field install the NFD shaft and handle:

1. Remove the unit front panel (see Fig. 2).
2. Remove (3) hex screws on the NFD enclosure – (2) on the face of the cover and (1) on the left side cover.

3. Remove the front cover of the NFD enclosure.
4. Make sure the NFD shipped from the factory is at OFF position (the arrow on the black handle knob is at OFF).
5. Insert the shaft with the cross pin on the top of the shaft in the horizontal position.
6. Measure from the tip of the shaft to the top surface of the black pointer; the measurement should be 3.75 – 3.88 in. (95 – 99 mm).
7. Tighten the locking screw to secure the shaft to the NFD.
8. Turn the handle to the OFF position with red arrow pointing at OFF.
9. Install the handle on to the painted cover horizontally with the red arrow pointing to the left.
10. Secure the handle to the painted cover with (2) screws and lock washers supplied.
11. Engaging the shaft into the handle socket, re-install (3) hex screws on the NFD enclosure.
12. Re-install the unit front panel.

FIGURE 17 | Handle and Shaft Assembly for NFD



Units with Factory-Installed Non-Fused Disconnect

When installing units, provide a disconnect switch per NEC (National Electrical Code) of adequate size. Disconnect sizing data is provided on the unit informative plate. Locate on unit cabinet or within sight of the unit per national or local codes. Do not cover unit informative plate if mounting the disconnect on the unit cabinet.

All units

All field wiring must comply with NEC and all local codes. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. See Fig. 16 and unit wiring diagram label for power wiring connections to the unit power terminal block and equipment ground. Maximum wire size is #4 ga AWG (copper only) per pole on contactors and #2ga AWG (copper only) per pole on optional non-fused disconnect .

Provide a ground-fault and short-circuit over-current protection device (fuse or breaker) per NEC Article 440 (or local codes). Refer to unit informative data plate for MOCP (Maximum Over-current Protection) device size. All field wiring must comply with the NEC and local requirements.

All units except 208/230-v units are factory wired for the voltage shown on the nameplate. *If the 208/230-v unit is to be connected to a 208-v power supply, the control transformer must be rewired by moving the black wire with the 1/4-in. female spade connector from the 230-v connection and moving it to the 208-v 1/4-in. male terminal on the primary side of the transformer.* Refer to unit label diagram for additional information.

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate. See Tables 4 to 7 for units produced on or after July 30, 2012 or Tables 8 to 11 for units produced prior to July 30, 2012. On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in the legend for Tables 4–11, Note 2 to determine the percent of voltage imbalance. Operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation would invalidate any applicable warranty.

NOTE: Check all factory and field electrical connections for tightness.

Convenience Outlets (Non-Powered) —



WARNING

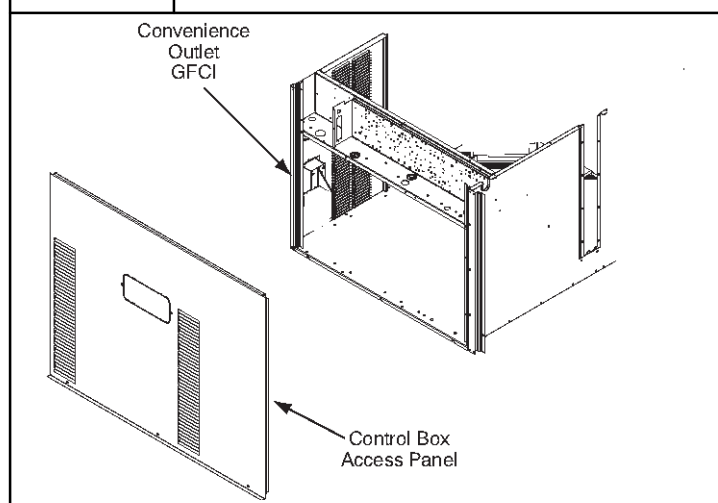
ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury or death.

Units with convenience outlet circuits may use multiple disconnects. Check convenience outlet for power status before opening unit for service. Locate its disconnect switch, if appropriate, and open it. Tag-out this switch, if necessary.

An optional non-powered convenience outlet are offered on RAH models: Non-powered provide a 125-volt GFCI (ground-fault circuit-interrupter) duplex receptacle rated at 15-A behind a hinged waterproof access cover, located on the end panel of the unit. See Fig. 18.

FIGURE 18 | Non-Powered Convenience Outlet Location



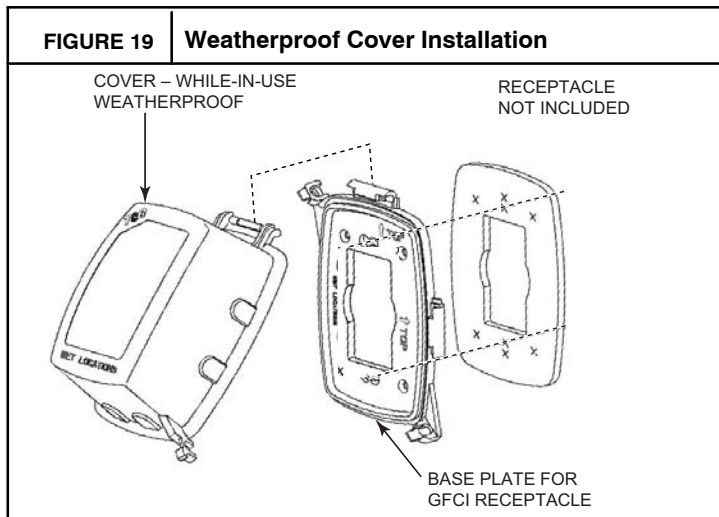
Installing Weatherproof Cover –

A weatherproof while-in-use cover for the factory-installed convenience outlets is now required by UL standards. This cover cannot be factory-mounted due its depth; it must be installed at unit installation. For shipment, the convenience outlet is covered with a blank cover plate.

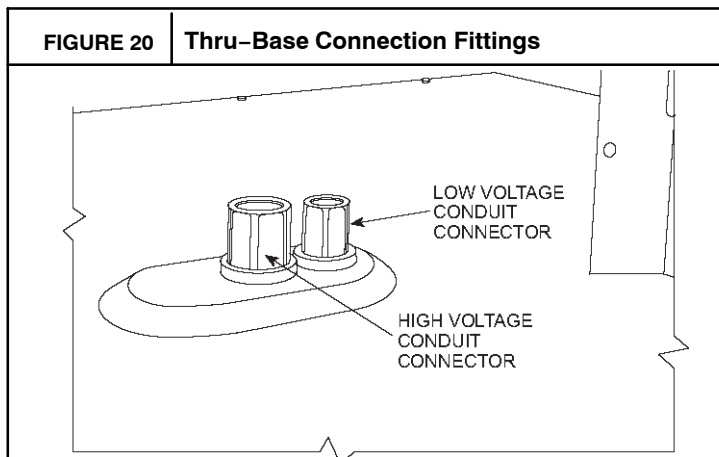
The weatherproof cover kit is shipped in the unit's control box. The kit includes the hinged cover, a backing plate and gasket.

Remove the blank cover plate at the convenience outlet; discard the blank cover.

Loosen the two screws at the GFCI duplex outlet, until approximately 1/2-in (13 mm) under screw heads are exposed. Press the gasket over the screw heads. Slip the backing plate over the screw heads at the keyhole slots and align with the gasket; tighten the two screws until snug (do not over-tighten).



Non-powered type: This type requires the field installation of a general-purpose 125-volt 15-A circuit powered from a source elsewhere in the building. Observe national and local codes when selecting wire size, fuse or breaker requirements and disconnect switch size and location. Route 125-v power supply conductors into the bottom of the utility box containing the duplex receptacle.



Optional Thru-Base Connections —

This accessory (field installed) service connection kit consists of a 1/2 in and a 1-1/4 in electrical bulkhead connector, all must be installed in the embossed (raised) section of the unit basepan in the condenser section. The 1/24-in bulkhead connector enables the low-voltage control wires to pass through the basepan. The 1-1/4 in electrical bulkhead connector allows the high-voltage power wires to pass through the basepan. See Fig. 20.

Note: This must be installed prior to mounting unit on roof curb.

Check tightness of connector lock nuts before connecting electrical conduits.

Field-supplied and field-installed liquid tight conduit connectors and conduit may be attached to the connectors on the basepan. Pull correctly rated high voltage and low voltage through appropriate conduits. Connect the power conduit to the internal disconnect (if unit is so equipped) or to the external disconnect (through unit side panel). A hole must be field cut in the main control box bottom on the left side so the 24-v control connections can be made. Connect the control power conduit to the unit control box at this hole.

Units without Thru-Base Connections —

1. Install power wiring conduit through side panel openings. Install conduit between disconnect and control box.
2. Install power lines to terminal connections.

Field Control Wiring —

The RAH unit requires an external temperature control device. This device typically applied with a commercial thermostat (field-supplied) with both occupied and unoccupied setpoints at a minimum.

Thermostat —

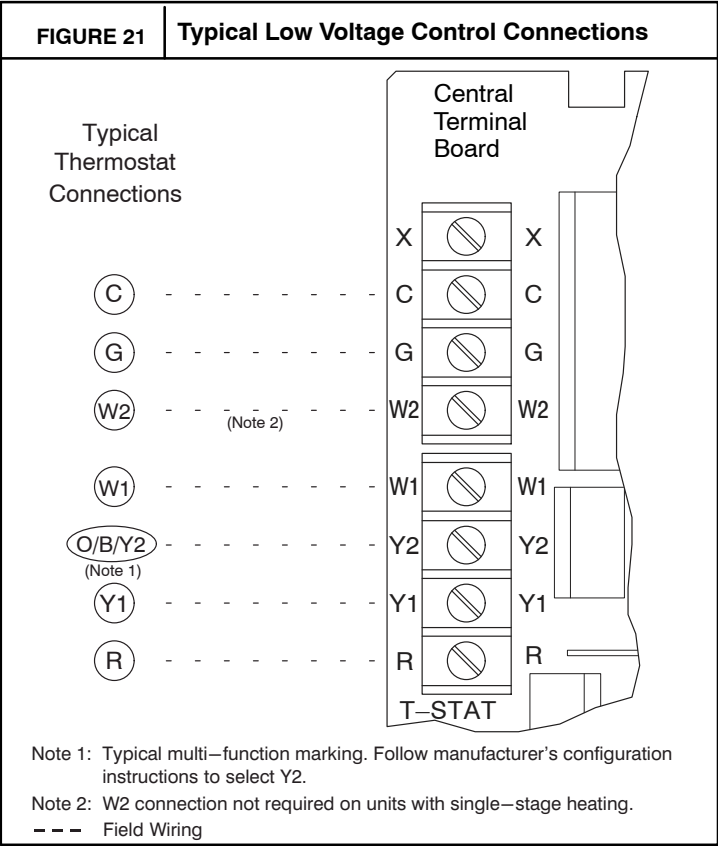
Install an approved accessory commercial thermostat according to installation instructions included with the accessory. For complete economizer function, select a two-stage cooling thermostat. Locate the thermostat accessory on a solid wall in the conditioned space to sense average temperature in accordance with the thermostat installation instructions.

If the thermostat contains a logic circuit requiring 24-v power, use a thermostat cable or equivalent single leads of different colors with minimum of seven leads. If the thermostat does not require a 24-v source (no "C" connection required), use a thermostat cable or equivalent with minimum of six leads. Check the thermostat installation instructions for additional features which might require additional conductors in the cable.

For wire runs up to 50 ft. (15 m), use no. 18 AWG (American Wire Gage) insulated wire (35°C minimum). For 50 to 75 ft. (15 to 23 m), use no. 16 AWG insulated wire (35°C minimum). For over 75 ft. (23 m), use no. 14 AWG insulated wire (35°C minimum). All wire sizes larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.

Unit without thru-base connection kit —

Pass the thermostat control wires through the hole provided in the corner post; then feed the wires through the raceway built into the corner post to the control box. Pull the wires over to the terminal strip on the upper-left corner of the Controls Connection Board. See Fig. 22.



NOTE:If thru-the-bottom connections accessory is used, refer to the accessory installation instructions for information on routing power and control wiring.

Heat Anticipator Settings —

Set heat anticipator settings at 0.14 amp for the first stage and 0.14 amp for second-stage heating, when available.

Electric Heaters

RAH units may be equipped with field-installed accessory electric heaters. The heaters are modular in design, with heater frames holding open coil resistance wires strung through ceramic insulators, line-break limit switches and a control contactor. One or two heater modules may be used in a unit.

Heater modules are installed in the compartment below the indoor (supply) fan outlet. Access is through the indoor access panel. Heater modules slide into the compartment on tracks along the bottom of the heater opening. See Fig. 23, Fig. 24 and Fig. 25.

Not all available heater modules may be used in every unit. Use only those heater modules that are UL listed for use in a specific size unit. Refer to the label on the unit cabinet for the list of approved heaters.

Unit heaters are marked with Heater Model Numbers. But heaters are ordered as and shipped in cartons marked with a corresponding heater Sales Package part number. See Table 2 for correlation between heater Model Number and Sales Package part number.

NOTE:The value in position 9 of the part number differs between the sales package part number (value is 1) and a bare heater model number (value is 0).

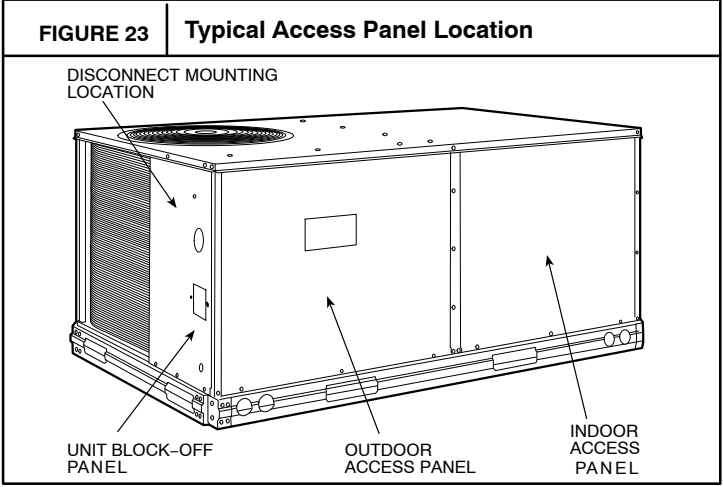
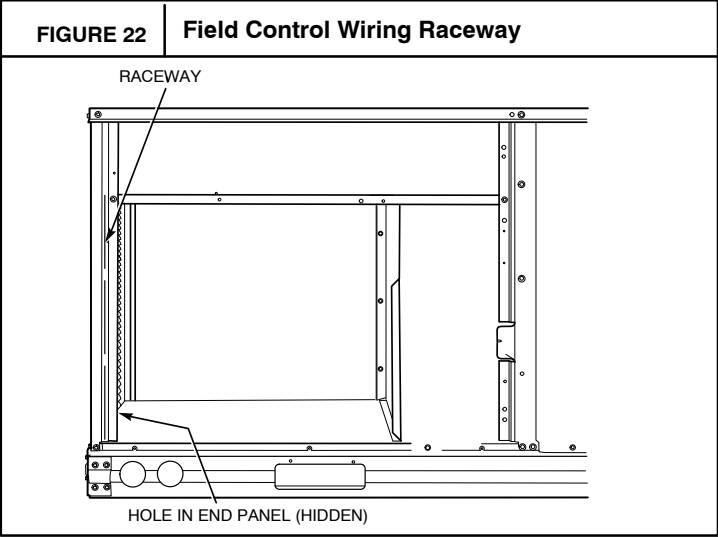
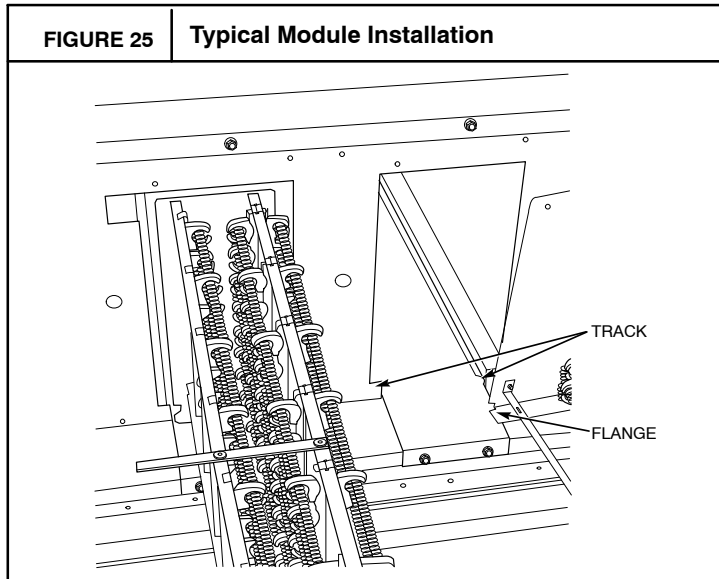
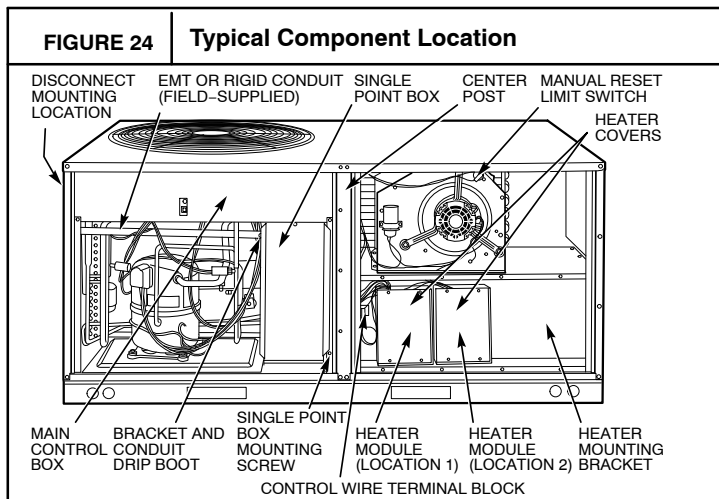


Table 3—Heater Model Number

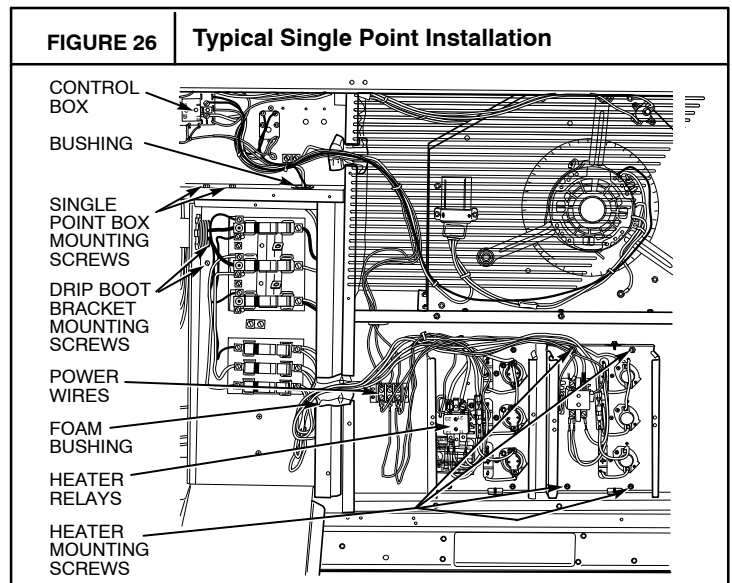
Bare Heater Model Number	C	R	H	E	A	T	E	R	0	0	1	A	0	0
Heater Sales Package PNO Includes: Bare Heater Carton and packing materials Installation sheet	C	R	H	E	A	T	E	R	1	0	1	A	0	0



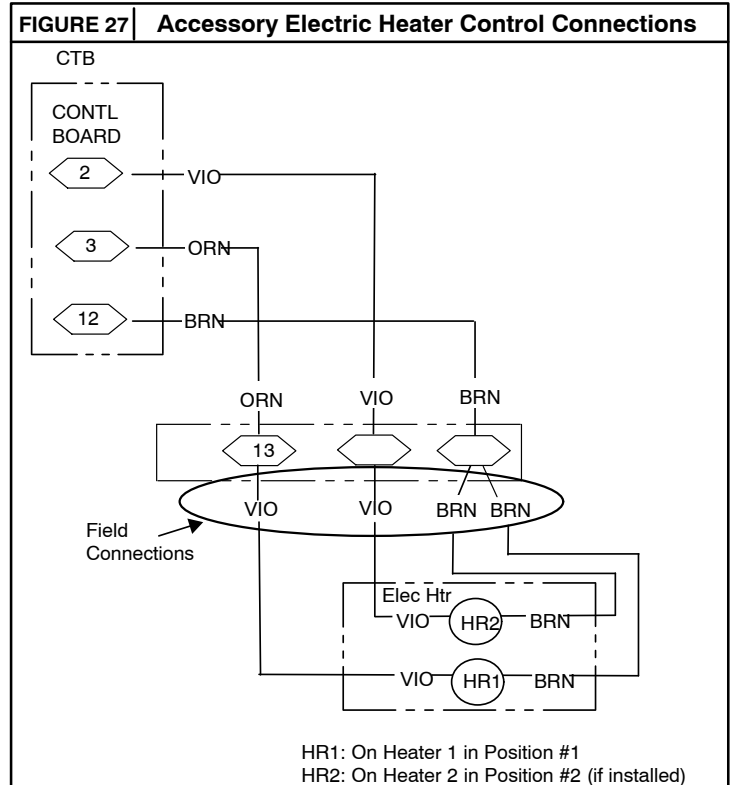
Single Point Boxes and Supplementary Fuses — When the unit MOCP device value exceeds 60-A, unit-mounted supplementary fuses are required for each heater circuit. These fuses are included in accessory Single Point Boxes, with power distribution and fuse blocks. The single point box will be installed directly under the unit control box, just to the left of the partition separating the indoor section (with electric heaters) from the outdoor section. The Single Point Box has a hinged access cover. See Fig. 26. The Single Point Box also includes a set of power taps and pigtails to complete the wiring between the Single Point Box and the unit's main control box terminals. Refer to the accessory heater and Single Point Box installation instructions for details on tap connections.

All fuses on RAH units are 60-A. (Note that all heaters are qualified for use with a 60-A fuse, regardless of actual heater ampacity, so only 60-A fuses are necessary.)

Single Point Boxes without Fuses — Unit heater applications not requiring supplemental fuses require a special Single Point Box without any fuses. The accessory Single Point Boxes contain a set of power taps and pigtails to complete the wiring between the Single Point Box and the unit's main control box terminals. Refer to accessory heater and Single Point Box installation instructions for details on tap connections.



Low-Voltage Control Connections — Pull the low-voltage control leads from the heater module(s) – VIO and BRN (two of each if two modules are installed; identify for Module #1) – to the 4-pole terminal board TB4 located on the heater bulkhead to the left of Heater #1. Connect the VIO lead from Heater #1 to terminal TB4-1. For 2 stage heating, connect the VIO lead from Heater #2 to terminal TB4-2. For 1 stage heating with 2 heater modules connect the VIO lead from both Heater #1 and #2 to terminal TB4-1. Connect both BRN leads to terminal TB4-3. See Fig. 27.



Variable Frequency Drive (VFD) 2-Speed Indoor Fan Motor System (Factory Option)

For details on operating RAH 2 stage cooling units equipped with the factory installed Variable Frequency Drive (VFD) 2-Speed Indoor Fan Motor System option, refer to the *Variable Frequency Drive (VFD) installation, Setup & Troubleshooting Supplement* (51306290100).

Economizer X – Ultra Low Leak Economizer (Factory Option)

For details on operating RAH 2 stage cooling units equipped with a factory installed Economizer X, refer to the *Economizer X Installation, Setup & Troubleshooting Supplement* (51306240200).

Hot Gas Reheat Control Connections

Hot Gas Reheat – Space RH Controller —

NOTE:Hot Gas Reheat is a factory installed option which is only available for units equipped with belt-drive motors.

The Hot Gas Reheat dehumidification system requires a field-supplied and -installed space relative humidity control

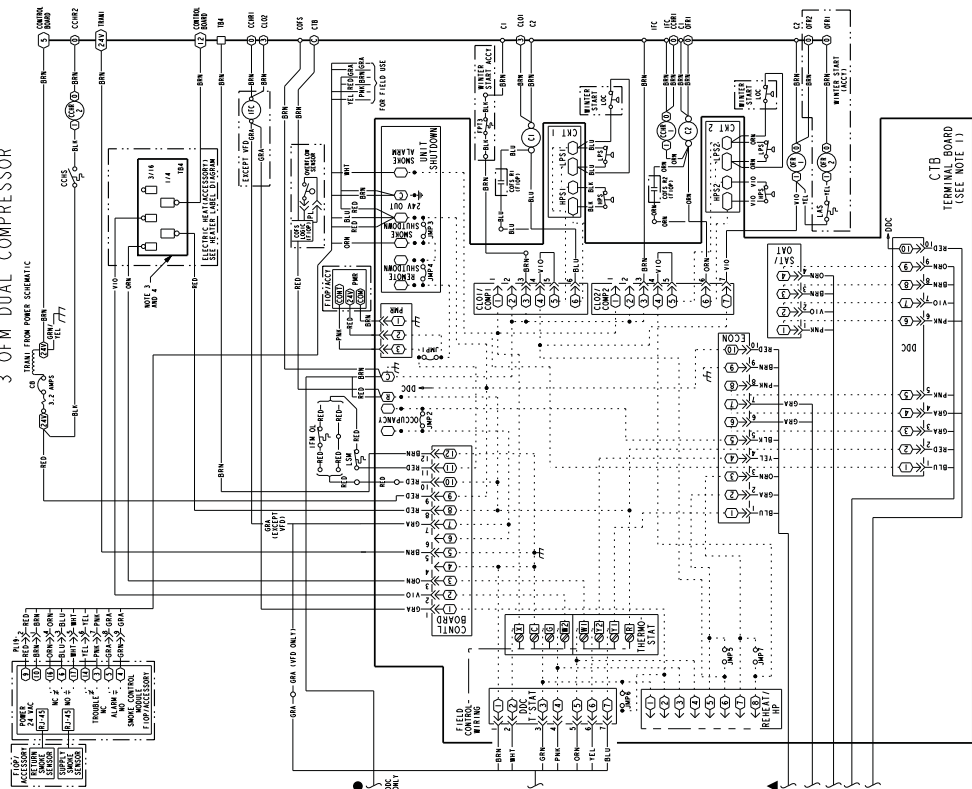
device. This device may be a separate humidistat control (contact closes on rise in space RH above control setpoint) or a combination thermostat-humidistat control device with isolated contact set for dehumidification control. The humidistat is normally used in applications where a temperature control is already provided (such as a third-party Building Management System).

To connect a field-supplied humidistat:

1. Route the humidistat 2-conductor cable (field-supplied) through the hole provided in the unit corner post.
2. Feed wires through the raceway built into the corner post (see Fig. 22) to the 24-v barrier located on the left side of the control box. The raceway provides the UL-required clearance between high-voltage and low-voltage wiring.
3. Use wire nuts to connect humidistat cable to the leads in the low-voltage wiring (as shown in Fig. 28), connecting PKN to PNK and PNK/BLK to PNK/BLK. Refer to the instructions for the field-supplied humidistat for more information.

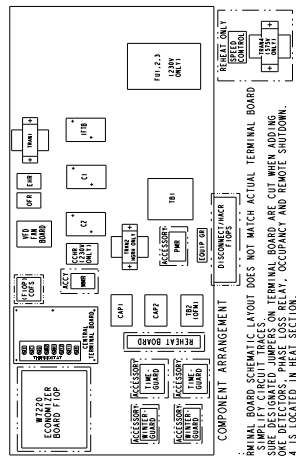
FIGURE 28 Typical Wiring Diagram (RAH with VFD Shown)

PAC CONTROL 208/230V 460V 575V
3 OFM DUAL COMPRESSOR

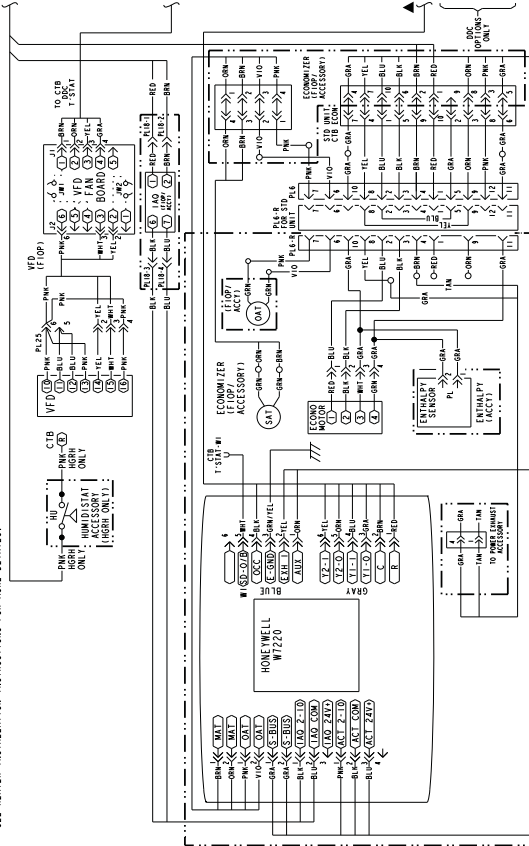


501M50 0641 D

501M50 1741 A



- NOTES:
1. TO SIMPLIFY CIRCUIT TRACES, TERMINAL BOARDS ARE CUT WHEN ADDING.
 2. SMOKE DETECTORS, PHASE LOSS RELAY, OCCUPANCY AND REMOTE SHUTDOWN.
 3. TBA IS LOCATED IN HEAT SECTION.
 4. HEATING(1) AND VIO ON TBA FOR SECOND STAGE HEATING(2). SEE HEATER INSTALLATION INSTRUCTIONS FOR MORE DETAILS.

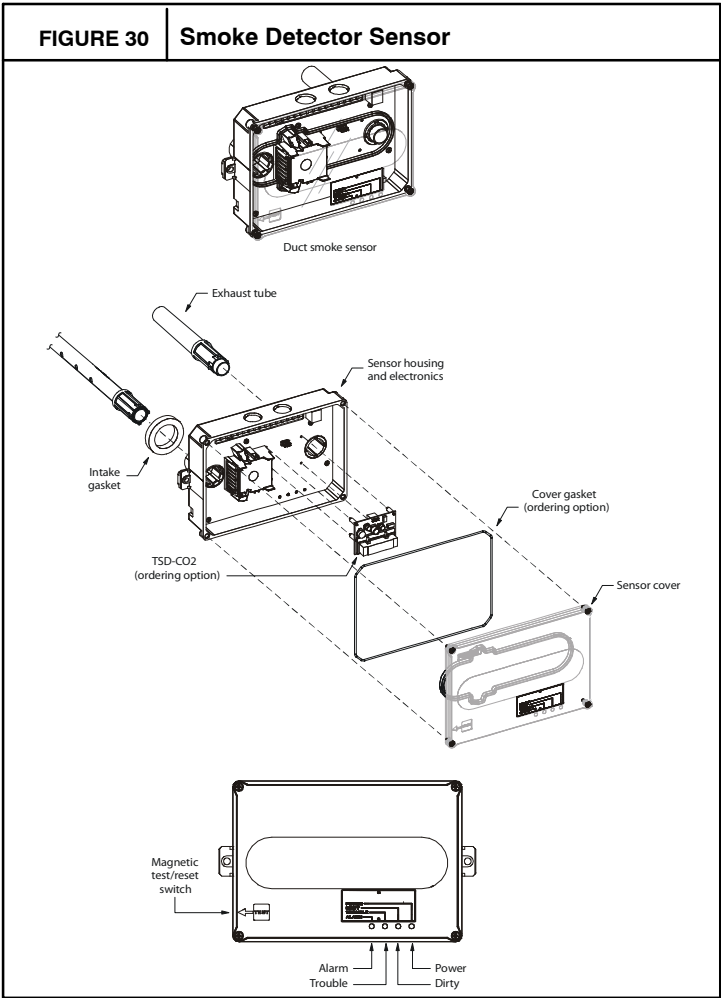
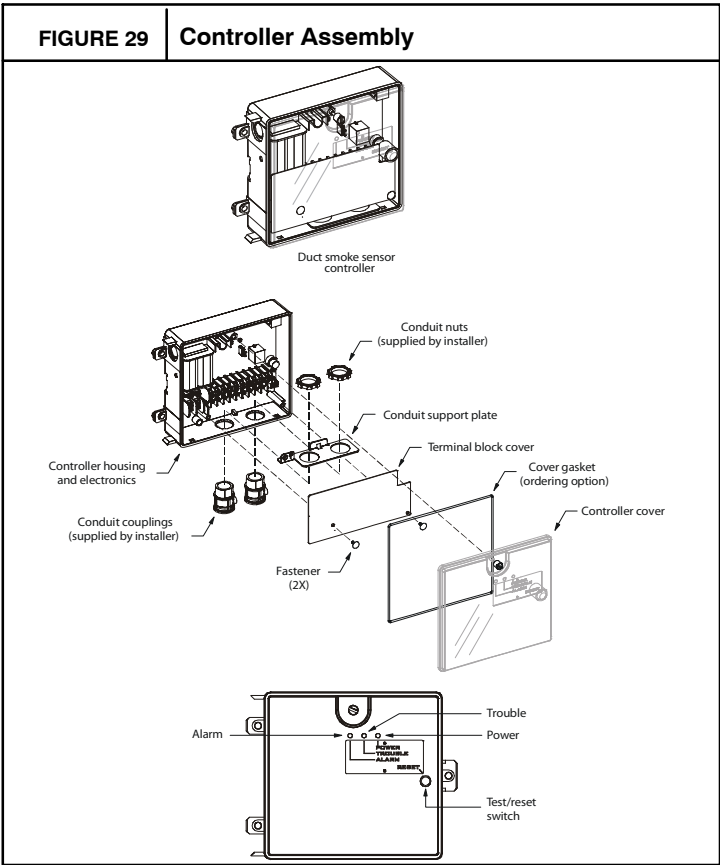


SMOKE DETECTORS

Smoke detectors are available as factory-installed options on RAH models. Smoke detectors may be specified for Supply Air only without or with economizer. All components necessary for operation are factory-provided and mounted. The unit is factory-configured for immediate smoke detector shutdown operation; additional wiring or modifications to unit terminal board may be necessary to complete the unit and smoke detector configuration to meet project requirements. Units equipped with factory-optional Return Air smoke detectors require a relocation of the sensor module at unit installation. See “Completing Installation of Return Air Smoke Sensor:” for details.

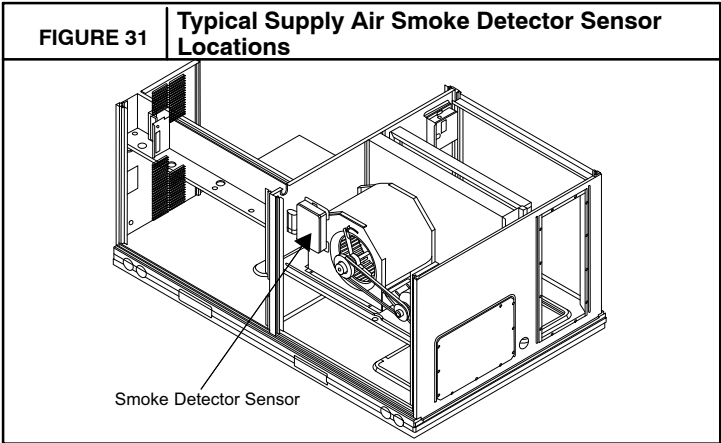
System

The smoke detector system consists of a four-wire controller and one or two sensors. Its primary function is to shut down the rooftop unit in order to prevent smoke from circulating throughout the building. Do not use as a life saving device.



Smoke Detector Locations

Supply Air — The Supply Air smoke detector sensor is located to the left of the unit’s indoor (supply) fan. See Fig. 30. Access is through the fan access panel. There is no sampling tube used at this location. The sampling tube inlet extends through the side plate of the fan housing (into a high pressure area). The controller is located on a bracket to the right of the return filter, accessed through the lift-off filter panel.



ELECTRICAL DATA FOR UNITS PRODUCED ON OR AFTER JULY 30, 2012

NOTE:Check the serial number of unit to verify production date.

SERIAL NUMBER

1	2	3	4	5	6	7	8	9	10
U	1	2	3	1	1	2	3	4	5

Manufacture Location

Week of Manufacture
(fiscal calendar)

Sequence Number

Year of Manufacture
(12 = 2012)

Table 4—Unit Wire/Fuse or HACR Breaker Sizing Data — Units Produced On or After July 30, 2012

Unit RAH	NO M. V.—Ph—Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.							
			CRHEAT- ER***A00	Nom (kW)	FLA	NO P.E.				w/ P.E. (pwrd fr/unit)			
						MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA
110	208/230—3—60	STD	NONE	—	—	51/50	60/60	53/53	284	54/54	60/60	57/57	288
			117A	7.8/10.4	21.7/25.0	51/50	60/60	53/53	284/284	54/54	60/60	57/57	288/288
			110A	12.0/16.0	33.4/38.5	51/57	60/60	53/53	284/284	56/62	60/70	57/57	288/288
			112A	24.0/32.0	66.7/77.0	92/105	100/110	85/96	284/284	97/110	100/110	89/101	288/288
			112A+117A	31.8/42.4	88.4/102.0	120/136	125/150	110/125	284/284	124/141	125/150	114/129	288/288
			112A+110A	37.6/50.0	104.2/120.3	139/129	150/150	128/146	284/284	144/134	150/150	132/150	288/288
		MED	NONE	—	—	54	60	57	313	58	70	62	317
			117A	7.8/10.4	21.7/25.0	54/54	60/60	57/57	313/313	58/58	70/70	62/62	317/317
			110A	12.0/16.0	33.4/38.5	55/62	60/70	57/57	313/313	60/67	70/70	62/62	317/317
			112A	24.0/32.0	66.7/77.0	97/110	100/110	89/101	313/313	102/115	110/125	93/105	317/317
			112A+117A	31.8/42.4	88.4/102.0	124/141	125/150	114/129	313/313	129/146	150/150	118/134	317/317
			112A+110A	37.6/50.0	104.2/120.3	144/134	150/150	132/151	313/313	149/139	150/150	136/155	317/317
		HIGH	NONE	—	—	57/56	70/60	61/60	315	61/60	70/70	65/64	319
			117A	7.8/10.4	21.7/25.0	57/56	70/60	61/60	315/315	61/60	70/70	65/64	319/319
			110A	12.0/16.0	33.4/38.5	59/64	70/70	61/60	315/315	64/69	70/70	65/64	319/319
			112A	24.0/32.0	66.7/77.0	101/113	110/125	92/103	315/315	106/117	110/125	97/108	319/319
			112A+117A	31.8/42.4	88.4/102.0	128/144	150/150	117/132	315/315	133/149	150/150	122/136	319/319
			112A+110A	37.6/50.0	104.2/120.3	148/137	150/150	135/153	315/315	152/141	175/175	140/157	319/319
	460—3—60	STD	NONE	—	—	23	25	24	136	25	30	26	138
			116A	13.9	16.7	26	30	24	136	28	30	26	138
			113A	16.5	19.8	29	30	27	136	32	35	29	138
			115A	33.0	39.7	54	60	50	136	57	60	52	138
			114A+116A	41.7	50.2	67	70	62	136	70	70	64	138
			115A+113A	50.0	60.1	65	70	73	136	67	70	75	138
		MED	NONE	—	—	25	30	26	151	27	30	28	153
			116A	13.9	16.7	28	30	26	151	30	30	28	153
			113A	16.5	19.8	32	35	29	151	34	35	31	153
			115A	33.0	39.7	57	60	52	151	59	60	54	153
			114A+116A	41.7	50.2	70	70	64	151	72	80	66	153
			115A+113A	50.0	60.1	67	80	75	151	69	80	77	153
		HIGH	NONE	—	—	26	30	28	152	28	30	30	154
			116A	13.9	16.7	29	30	28	152	32	35	30	154
			113A	16.5	19.8	33	35	30	152	35	35	32	154
			115A	33.0	39.7	58	60	53	152	60	60	55	154
			114A+116A	41.7	50.2	71	80	65	152	73	80	67	154
			115A+113A	50.0	60.1	69	80	76	152	71	80	79	154
	575—3—60	STD	NONE	—	—	18	20	18	95	21	25	23	99
			118A	17.0	20.4	28	30	26	95	33	35	30	99
			119A	34.0	40.9	54	60	49	95	59	60	54	99
			118A+119A	51.0	61.3	64	70	73	95	69	80	77	99
		MED	NONE	—	—	18	20	19	106	22	25	23	110
			118A	17.0	20.4	29	30	27	106	34	35	31	110
			119A	34.0	40.9	55	60	50	106	60	60	55	110
			118A+119A	51.0	61.3	65	70	74	106	70	80	78	110
		HIGH	NONE	—	—	21	25	22	120	25	30	27	124
			118A	17.0	20.4	33	35	30	120	38	40	34	124
			119A	34.0	40.9	59	60	53	120	63	70	58	124
			118A+119A	51.0	61.3	69	80	77	120	74	80	81	124

See: "Legend and Notes for Tables 4 — 11" on page 29.

Table 5—Unit Wire/Fuse or HACR Breaker Sizing Data — Units Produced On or After July 30, 2012

Unit RAH	NO M. V.—Ph—Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.							
			CRHEATER***A00	Nom (kW)	FLA	NO P.E.				w/ P.E. (pwrdr fr/unit)			
						MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA
120	208/230—3—60	STD	NONE	—	—	49/49	60/60	52/51	309	53/53	60/60	56/56	313
			117A	7.8/10.4	21.7/25.0	49/49	60/60	52/51	309/309	53/53	60/60	56/56	313/313
			110A	12.0/16.0	33.4/38.5	51/57	60/60	52/52	309/309	56/62	60/70	56/56	313/313
			112A	24.0/32.0	66.7/77.0	92/105	100/110	85/96	309/309	97/110	100/110	89/101	313/313
			112A+117A	31.8/42.4	88.4/102.0	120/136	125/150	110/125	309/309	124/141	125/150	114/129	313/313
			112A+110A	37.6/50.0	104.2/120.3	139/129	150/150	128/146	309/309	144/134	150/150	132/150	313/313
		MED	NONE	—	—	53	60	56	338	57	70	60	342
			117A	7.8/10.4	21.7/25.0	53/53	60/60	56/56	338/338	57/57	70/70	60/60	342/342
			110A	12.0/16.0	33.4/38.5	55/62	60/70	56/56	338/338	60/67	70/70	60/61	342/342
			112A	24.0/32.0	66.7/77.0	97/110	100/110	89/101	338/338	102/115	110/125	93/105	342/342
			112A+117A	31.8/42.4	88.4/102.0	124/141	125/150	114/129	338/338	129/146	150/150	118/134	342/342
			112A+110A	37.6/50.0	104.2/120.3	144/134	150/150	132/151	338/338	149/139	150/150	136/155	342/342
		HIGH	NONE	—	—	56/55	60/60	59/58	340	60/59	70/70	64/63	344
			117A	7.8/10.4	21.7/25.0	56/55	60/60	59/58	340/340	60/59	70/70	64/63	344/344
			110A	12.0/16.0	33.4/38.5	59/64	60/70	59/59	340/340	64/69	70/70	64/63	344/344
			112A	24.0/32.0	66.7/77.0	101/113	110/125	92/103	340/340	106/117	110/125	97/108	344/344
			112A+117A	31.8/42.4	88.4/102.0	128/144	150/150	117/132	340/340	133/149	150/150	122/136	344/344
			112A+110A	37.6/50.0	104.2/120.3	148/137	150/150	135/153	340/340	152/141	175/175	140/157	344/344
	460—3—60	STD	NONE	—	—	24	30	25	148	26	30	27	150
			116A	13.9	16.7	26	30	25	148	28	30	27	150
			113A	16.5	19.8	29	30	27	148	32	35	29	150
			115A	33.0	39.7	54	60	50	148	57	60	52	150
			114A+116A	41.7	50.2	67	70	62	148	70	70	64	150
			115A+113A	50.0	60.1	65	70	73	148	67	70	75	150
		MED	NONE	—	—	26	30	27	163	28	30	29	165
			116A	13.9	16.7	28	30	27	163	30	30	29	165
			113A	16.5	19.8	32	35	29	163	34	35	31	165
			115A	33.0	39.7	57	60	52	163	59	60	54	165
			114A+116A	41.7	50.2	70	70	64	163	72	80	66	165
			115A+113A	50.0	60.1	67	80	75	163	69	80	77	165
		HIGH	NONE	—	—	27	30	29	164	29	35	31	166
			116A	13.9	16.7	29	30	29	164	32	35	31	166
			113A	16.5	19.8	33	35	30	164	35	35	32	166
			115A	33.0	39.7	58	60	53	164	60	60	55	166
			114A+116A	41.7	50.2	71	80	65	164	73	80	67	166
			115A+113A	50.0	60.1	69	80	76	164	71	80	79	166
	575—3—60	STD	NONE	—	—	18	20	18	105	22	25	23	109
			118A	17.0	20.4	28	30	26	105	33	35	30	109
			119A	34.0	40.9	54	60	49	105	59	60	54	109
			118A+119A	51.0	61.3	64	70	73	105	69	80	77	109
		MED	NONE	—	—	19	20	19	116	22	25	24	120
			118A	17.0	20.4	29	30	27	116	34	35	31	120
			119A	34.0	40.9	55	60	50	116	60	60	55	120
			118A+119A	51.0	61.3	65	70	74	116	70	80	78	120
		HIGH	NONE	—	—	21	25	22	130	25	30	27	134
			118A	17.0	20.4	33	35	30	130	38	40	34	134
			119A	34.0	40.9	59	60	53	130	63	70	58	134
			118A+119A	51.0	61.3	69	80	77	130	74	80	81	134

See: "Legend and Notes for Tables 4 — 11" on page 29.

Table 6—Unit Wire Sizing with Factory Installed 2 Speed Indoor Fan Option — Units Produced On or After July 30, 2012

Unit RAH	NO M. V.—Ph—Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.							
			CRHEATER***A00	Nom (kW)	FLA	NO RE.				w/ RE. (pwrdr fr/unit)			
						MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA
110	208/230—3—60	STD	NONE	—	—	51/50	60/60	53/53	254	55/54	60/60	58/57	258
			117A	7.8/10.4	21.7/25.0	51/50	60/60	53/53	254/254	55/54	60/60	58/57	258/258
			110A	12.0/16.0	33.4/38.5	51/57	60/60	53/53	254/254	56/62	60/70	58/57	258/258
			112A	24.0/32.0	66.7/77.0	93/105	100/110	85/96	254/254	97/110	100/110	89/101	258/258
			112A+117A	31.8/42.4	88.4/102.0	120/136	125/150	110/125	254/254	125/141	125/150	114/129	258/258
			112A+110A	37.6/50.0	104.2/120.3	140/129	150/150	128/146	254/254	144/134	150/150	132/151	258/258
		MED	NONE	—	—	54/53	60/60	58/56	304	58/57	70/70	62/61	308
			117A	7.8/10.4	21.7/25.0	54/53	60/60	58/56	304/304	58/57	70/70	62/61	308/308
			110A	12.0/16.0	33.4/38.5	56/61	60/70	58/56	304/304	60/66	70/70	62/61	308/308
			112A	24.0/32.0	66.7/77.0	97/109	100/110	89/100	304/304	102/114	110/125	93/104	308/308
			112A+117A	31.8/42.4	88.4/102.0	124/140	125/150	114/129	304/304	129/145	150/150	118/133	308/308
			112A+110A	37.6/50.0	104.2/120.3	144/133	150/150	132/150	304/304	149/138	150/150	137/154	308/308
		HIGH	NONE	—	—	57/56	70/60	61/60	315	61/60	70/70	65/64	319
			117A	7.8/10.4	21.7/25.0	57/56	70/60	61/60	315/315	61/60	70/70	65/64	319/319
			110A	12.0/16.0	33.4/38.5	59/64	70/70	61/60	315/315	64/69	70/70	65/64	319/319
			112A	24.0/32.0	66.7/77.0	101/113	110/125	92/103	315/315	106/117	110/125	97/108	319/319
			112A+117A	31.8/42.4	88.4/102.0	128/144	150/150	117/132	315/315	133/149	150/150	122/136	319/319
			112A+110A	37.6/50.0	104.2/120.3	148/137	150/150	135/153	315/315	152/141	175/175	140/157	319/319
	460—3—60	STD	NONE	—	—	24	30	25	122	25	30	27	124
			116A	13.9	16.7	26	30	25	122	28	30	27	124
			113A	16.5	19.8	30	30	27	122	32	35	29	124
			115A	33.0	39.7	55	60	50	122	57	60	52	124
			114A+116A	41.7	50.2	68	70	62	122	70	70	64	124
			115A+113A	50.0	60.1	65	70	73	122	68	80	76	124
		MED	NONE	—	—	25	30	26	147	27	30	28	149
			116A	13.9	16.7	27	30	26	147	30	30	28	149
			113A	16.5	19.8	31	35	28	147	34	35	30	149
			115A	33.0	39.7	56	60	51	147	58	60	53	149
			114A+116A	41.7	50.2	69	70	63	147	72	80	65	149
			115A+113A	50.0	60.1	67	80	75	147	69	80	77	149
		HIGH	NONE	—	—	26	30	28	152	28	30	30	154
			116A	13.9	16.7	29	30	28	152	32	35	30	154
			113A	16.5	19.8	33	35	30	152	35	35	32	154
			115A	33.0	39.7	58	60	53	152	60	60	55	154
			114A+116A	41.7	50.2	71	80	65	152	73	80	67	154
			115A+113A	50.0	60.1	69	80	76	152	71	80	79	154
	575—3—60	STD	NONE	—	—	19	20	20	97	23	25	24	101
			118A	17.0	20.4	30	30	27	97	35	35	32	101
			119A	34.0	40.9	56	60	51	97	61	70	55	101
			118A+119A	51.0	61.3	66	70	75	97	71	80	79	101
		MED	NONE	—	—	20	25	21	106	24	25	25	110
			118A	17.0	20.4	32	35	29	106	36	40	33	110
			119A	34.0	40.9	57	60	52	106	62	70	57	110
			118A+119A	51.0	61.3	67	80	76	106	72	80	80	110
		HIGH	NONE	—	—	22	25	23	120	26	30	27	124
			118A	17.0	20.4	34	35	31	120	38	40	35	124
			119A	34.0	40.9	59	60	54	120	64	70	59	124
			118A+119A	51.0	61.3	70	80	78	120	74	80	82	124

See: "Legend and Notes for Tables 4 — 11" on page 29.

Table 7—Unit Wire Sizing with Factory Installed 2 Speed Indoor Fan Option — Units Produced On or After July 30, 2012

Unit RAH	IO M. V. Ph-Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.							
			CRHEATER***A00	Nom (kW)	FLA	NO P.E.				w/ P.E. (pwrdr fr/unit)			
						MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA
120	208/230-3-60	STD	NONE	—	—	50/49	60/60	52/52	279	53/53	60/60	56/56	283
			117A	7.8/10.4	21.7/25.0	50/49	60/60	52/52	279/279	53/53	60/60	56/56	283/283
			110A	12.0/16.0	33.4/38.5	51/57	60/60	52/52	279/279	56/62	60/70	56/56	283/283
			112A	24.0/32.0	66.7/77.0	93/105	100/110	85/96	279/279	97/110	100/110	89/101	283/283
			112A+117A	31.8/42.4	88.4/102.0	120/136	125/150	110/125	279/279	125/141	125/150	114/129	283/283
			112A+110A	37.6/50.0	104.2/120.3	140/129	150/150	128/146	279/279	144/134	150/150	132/151	283/283
		MED	NONE	—	—	53/52	60/60	56/55	329	57/56	70/60	60/59	333
			117A	7.8/10.4	21.7/25.0	53/52	60/60	56/55	329/329	57/56	70/60	60/59	333/333
			110A	12.0/16.0	33.4/38.5	56/61	60/70	56/56	329/329	60/66	70/70	60/60	333/333
			112A	24.0/32.0	66.7/77.0	97/109	100/110	89/100	329/329	102/114	110/125	93/104	333/333
			112A+117A	31.8/42.4	88.4/102.0	124/140	125/150	114/129	329/329	129/145	150/150	118/133	333/333
			112A+110A	37.6/50.0	104.2/120.3	144/133	150/150	132/150	329/329	149/138	150/150	137/154	333/333
		HIGH	NONE	—	—	56/55	60/60	59/58	340	60/59	70/70	64/63	344
			117A	7.8/10.4	21.7/25.0	56/55	60/60	59/58	340/340	60/59	70/70	64/63	344/344
			110A	12.0/16.0	33.4/38.5	59/64	60/70	59/59	340/340	64/69	70/70	64/63	344/344
			112A	24.0/32.0	66.7/77.0	101/113	110/125	92/103	340/340	106/117	110/125	97/108	344/344
			112A+117A	31.8/42.4	88.4/102.0	128/144	150/150	117/132	340/340	133/149	150/150	122/136	344/344
			112A+110A	37.6/50.0	104.2/120.3	148/137	150/150	135/153	340/340	152/141	175/175	140/157	344/344
	460-3-60	STD	NONE	—	—	25	30	26	134	26	30	28	136
			116A	13.9	16.7	26	30	26	134	28	30	28	136
			113A	16.5	19.8	30	30	27	134	32	35	29	136
			115A	33.0	39.7	55	60	50	134	57	60	52	136
			114A+116A	41.7	50.2	68	70	62	134	70	70	64	136
			115A+113A	50.0	60.1	65	70	73	134	68	80	76	136
		MED	NONE	—	—	26	30	27	159	28	30	29	161
			116A	13.9	16.7	27	30	27	159	30	30	29	161
			113A	16.5	19.8	31	35	28	159	34	35	30	161
			115A	33.0	39.7	56	60	51	159	58	60	53	161
			114A+116A	41.7	50.2	69	70	63	159	72	80	65	161
			115A+113A	50.0	60.1	67	80	75	159	69	80	77	161
		HIGH	NONE	—	—	27	30	29	164	29	35	31	166
			116A	13.9	16.7	29	30	29	164	32	35	31	166
			113A	16.5	19.8	33	35	30	164	35	35	32	166
			115A	33.0	39.7	58	60	53	164	60	60	55	166
			114A+116A	41.7	50.2	71	80	65	164	73	80	67	166
			115A+113A	50.0	60.1	69	80	76	164	71	80	79	166
	575-3-60	STD	NONE	—	—	19	25	20	107	23	25	24	111
			118A	17.0	20.4	30	30	27	107	35	35	32	111
			119A	34.0	40.9	56	60	51	107	61	70	55	111
			118A+119A	51.0	61.3	66	70	75	107	71	80	79	111
		MED	NONE	—	—	20	25	21	116	24	30	26	120
			118A	17.0	20.4	32	35	29	116	36	40	33	120
			119A	34.0	40.9	57	60	52	116	62	70	57	120
			118A+119A	51.0	61.3	67	80	76	116	72	80	80	120
		HIGH	NONE	—	—	22	25	23	130	26	30	27	134
			118A	17.0	20.4	34	35	31	130	38	40	35	134
			119A	34.0	40.9	59	60	54	130	64	70	59	134
			118A+119A	51.0	61.3	70	80	78	130	74	80	82	134

See: "Legend and Notes for Tables 4 – 11" on page 29.

ELECTRICAL DATA FOR UNITS PRODUCED PRIOR TO JULY 30, 2012

NOTE: Check the serial number of unit to verify production date.

SERIAL NUMBER

1	2	3	4	5	6	7	8	9	10
U	1	2	3	1	1	2	3	4	5

Manufacture Location

Week of Manufacture
(fiscal calendar)

Sequence Number

Year of Manufacture
(12 = 2012)

Table 8—Unit Wire/Fuse or HACR Breaker Sizing Data — Units Produced Prior To July 30, 2012

Unit RAH	NOM. V—Ph—Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.							
			CRHEATER***A00	Nom (kW)	FLA	NO P.E.				w/ P.E. (pwrd fr/unit)			
						MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA
110	208/230—3—60	STD	NONE	—	—	49	60	51	257	53	60	55	261
			117A	7.8/10.4	21.7/25.0	49/49	60/60	51/51	257/257	53/53	60/60	55/55	261/261
			110A	12.0/16.0	33.4/38.5	49/55	60/60	51/51	257/257	53/60	60/60	55/55	261/261
			112A	24.0/32.0	66.7/77.0	90/103	90/110	83/95	257/257	95/108	100/110	87/99	261/261
			112A+117A	31.8/42.4	88.4/102.0	117/134	125/150	108/123	257/257	122/139	125/150	112/128	261/261
			112A+110A	37.6/50.0	104.2/120.3	137/127	150/150	126/144	257/257	142/132	150/150	130/149	261/261
		MED	NONE	—	—	54	60	57	300	57	70	61	304
			117A	7.8/10.4	21.7/25.0	54/54	60/60	57/57	300/300	57/57	70/70	61/61	304/304
			110A	12.0/16.0	33.4/38.5	55/61	60/70	57/57	300/300	59/66	70/70	61/61	304/304
			112A	24.0/32.0	66.7/77.0	96/109	100/110	88/100	300/300	101/114	110/125	93/104	304/304
			112A+117A	31.8/42.4	88.4/102.0	123/140	125/150	113/129	300/300	128/145	150/150	118/133	304/304
			112A+110A	37.6/50.0	104.2/120.3	143/133	150/150	131/150	300/300	148/138	150/150	136/154	304/304
		HIGH	NONE	—	—	59	70	62	309	62	70	67	313
			117A	7.8/10.4	21.7/25.0	59/59	70/70	62/62	309/309	62/62	70/70	67/67	313/313
			110A	12.0/16.0	33.4/38.5	61/67	70/70	62/62	309/309	66/72	70/80	67/67	313/313
			112A	24.0/32.0	66.7/77.0	103/115	110/125	94/106	309/309	107/120	110/125	98/110	313/313
			112A+117A	31.8/42.4	88.4/102.0	130/147	150/150	119/135	309/309	134/151	150/175	123/139	313/313
			112A+110A	37.6/50.0	104.2/120.3	149/140	150/175	137/156	309/309	154/144	175/175	141/160	313/313
	460—3—60	STD	NONE	—	—	22	25	23	123	24	30	25	125
			116A	13.9	16.7	25	25	23	123	27	30	25	125
			113A	16.5	19.8	28	30	26	123	31	35	28	125
			115A	33.0	39.7	53	60	49	123	56	60	51	125
			114A+116A	41.7	50.2	66	70	61	123	69	70	63	125
			115A+113A	50.0	60.1	64	70	72	123	66	70	74	125
		MED	NONE	—	—	24	30	25	145	26	30	27	147
			116A	13.9	16.7	27	30	25	145	29	30	27	147
			113A	16.5	19.8	31	35	28	145	33	35	30	147
			115A	33.0	39.7	56	60	51	145	58	60	53	147
			114A+116A	41.7	50.2	69	70	63	145	71	80	65	147
			115A+113A	50.0	60.1	66	80	74	145	68	80	76	147
		HIGH	NONE	—	—	27	30	29	149	29	35	31	151
			116A	13.9	16.7	31	35	29	149	33	35	31	151
			113A	16.5	19.8	34	35	31	149	37	40	33	151
			115A	33.0	39.7	59	60	54	149	62	70	56	151
			114A+116A	41.7	50.2	72	80	66	149	75	80	68	151
			115A+113A	50.0	60.1	70	80	78	149	72	80	80	151
	575—3—60	STD	NONE	—	—	18	20	18	95	21	25	23	99
			118A	17.0	20.4	28	30	26	95	33	35	30	99
			119A	34.0	40.9	54	60	49	95	59	60	54	99
			118A+119A	51.0	61.3	64	70	73	95	69	80	77	99
		MED	NONE	—	—	18	20	19	106	22	25	23	110
			118A	17.0	20.4	29	30	27	106	34	35	31	110
			119A	34.0	40.9	55	60	50	106	60	60	55	110
			118A+119A	51.0	61.3	65	70	74	106	70	80	78	110
		HIGH	NONE	—	—	21	25	22	120	25	30	27	124
			118A	17.0	20.4	33	35	30	120	38	40	34	124
			119A	34.0	40.9	59	60	53	120	63	70	58	124
			118A+119A	51.0	61.3	69	80	77	120	74	80	81	124

See: "Legend and Notes for Tables 4 – 11" on page 29.

Table 9—Unit Wire/Fuse or HACR Breaker Sizing Data — Units Produced Prior To July 30, 2012

Unit RAH	NOM. V.—Ph—HZ	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.							
			CRHEATER***A00	Nom (kW)	FLA	NO PE.				w/ P.E. (pwrd fr/unit)			
						MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA
120	208/230—3—60	STD	NONE	—	—	48	60	50	282	51	60	54	286
			117A	7.8/10.4	21.7/25.0	48/48	60/60	50/50	282/282	51/51	60/60	54/54	286/286
			110A	12.0/16.0	33.4/38.5	49/55	60/60	50/50	282/282	53/60	60/60	54/55	286/286
			112A	24.0/32.0	66.7/77.0	90/103	90/110	83/95	282/282	95/108	100/110	87/99	286/286
			112A+117A	31.8/42.4	88.4/102.0	117/134	125/150	108/123	282/282	122/139	125/150	112/128	286/286
			112A+110A	37.6/50.0	104.2/120.3	137/127	150/150	126/144	282/282	142/132	150/150	130/149	286/286
		MED	NONE	—	—	52	60	55	325	56	60	60	329
			117A	7.8/10.4	21.7/25.0	52/52	60/60	55/55	325/325	56/56	60/60	60/60	329/329
			110A	12.0/16.0	33.4/38.5	55/61	60/70	55/56	325/325	59/66	60/70	60/60	329/329
			112A	24.0/32.0	66.7/77.0	96/109	100/110	88/100	325/325	101/114	110/125	93/104	329/329
			112A+117A	31.8/42.4	88.4/102.0	123/140	125/150	113/129	325/325	128/145	150/150	118/133	329/329
			112A+110A	37.6/50.0	104.2/120.3	143/133	150/150	131/150	325/325	148/138	150/150	136/154	329/329
		HIGH	NONE	—	—	57	70	61	334	61	70	65	338
			117A	7.8/10.4	21.7/25.0	57/57	70/70	61/61	334/334	61/61	70/70	65/65	338/338
			110A	12.0/16.0	33.4/38.5	61/67	70/70	61/62	334/334	66/72	70/80	65/66	338/338
			112A	24.0/32.0	66.7/77.0	103/115	110/125	94/106	334/334	107/120	110/125	98/110	338/338
			112A+117A	31.8/42.4	88.4/102.0	130/147	150/150	119/135	334/334	134/151	150/175	123/139	338/338
			112A+110A	37.6/50.0	104.2/120.3	149/140	150/175	137/156	334/334	154/144	175/175	141/160	338/338
	460—3—60	STD	NONE	—	—	23	30	24	135	25	30	26	137
			116A	13.9	16.7	25	30	24	135	27	30	26	137
			113A	16.5	19.8	28	30	26	135	31	35	28	137
			115A	33.0	39.7	53	60	49	135	56	60	51	137
			114A+116A	41.7	50.2	66	70	61	135	69	70	63	137
			115A+113A	50.0	60.1	64	70	72	135	66	70	74	137
		MED	NONE	—	—	25	30	26	157	27	30	28	159
			116A	13.9	16.7	27	30	26	157	29	30	28	159
			113A	16.5	19.8	31	35	28	157	33	35	30	159
			115A	33.0	39.7	56	60	51	157	58	60	53	159
			114A+116A	41.7	50.2	69	70	63	157	71	80	65	159
			115A+113A	50.0	60.1	66	80	74	157	68	80	76	159
		HIGH	NONE	—	—	28	30	30	161	30	35	32	163
			116A	13.9	16.7	31	35	30	161	33	35	32	163
			113A	16.5	19.8	34	35	31	161	37	40	33	163
			115A	33.0	39.7	59	60	54	161	62	70	56	163
			114A+116A	41.7	50.2	72	80	66	161	75	80	68	163
			115A+113A	50.0	60.1	70	80	78	161	72	80	80	163
	575—3—60	STD	NONE	—	—	18	20	18	105	22	25	23	109
			118A	17.0	20.4	28	30	26	105	33	35	30	109
			119A	34.0	40.9	54	60	49	105	59	60	54	109
			118A+119A	51.0	61.3	64	70	73	105	69	80	77	109
		MED	NONE	—	—	19	20	19	116	22	25	24	120
			118A	17.0	20.4	29	30	27	116	34	35	31	120
			119A	34.0	40.9	55	60	50	116	60	60	55	120
			118A+119A	51.0	61.3	65	70	74	116	70	80	78	120
		HIGH	NONE	—	—	21	25	22	130	25	30	27	134
			118A	17.0	20.4	33	35	30	130	38	40	34	134
			119A	34.0	40.9	59	60	53	130	63	70	58	134
			118A+119A	51.0	61.3	69	80	77	130	74	80	81	134

See: "Legend and Notes for Tables 4 — 11" on page 29.

Table 10—Unit Wire Sizing with Factory Installed 2 Speed Indoor Fan Option — Units Produced Prior To July 30, 2012

Unit RAH	NOM. V—Ph—HZ	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.							
			CRHEATER***A00	Nom (kW)	FLA	NO P.E.				w/ P.E. (pwr'd fr/unit)			
						MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA
110	208/230—3—60	STD	NONE	—	—	51/50	60/60	53/53	254	55/54	60/60	58/57	258
			117A	7.8/10.4	21.7/25.0	51/50	60/60	53/53	254/254	55/54	60/60	58/57	258/258
			110A	12.0/16.0	33.4/38.5	51/57	60/60	53/53	254/254	56/62	60/70	58/57	258/258
			112A	24.0/32.0	66.7/77.0	93/105	100/110	85/96	254/254	97/110	100/110	89/101	258/258
			112A+117A	31.8/42.4	88.4/102.0	120/136	125/150	110/125	254/254	125/141	125/150	114/129	258/258
			112A+110A	37.6/50.0	104.2/120.3	140/129	150/150	128/146	254/254	144/134	150/150	132/151	258/258
		MED	NONE	—	—	54/53	60/60	58/56	304	58/57	70/70	62/61	308
			117A	7.8/10.4	21.7/25.0	54/53	60/60	58/56	304/304	58/57	70/70	62/61	308/308
			110A	12.0/16.0	33.4/38.5	56/61	60/70	58/56	304/304	60/66	70/70	62/61	308/308
			112A	24.0/32.0	66.7/77.0	97/109	100/110	89/100	304/304	102/114	110/125	93/104	308/308
			112A+117A	31.8/42.4	88.4/102.0	124/140	125/150	114/129	304/304	129/145	150/150	118/133	308/308
			112A+110A	37.6/50.0	104.2/120.3	144/133	150/150	132/150	304/304	149/138	150/150	137/154	308/308
		HIGH	NONE	—	—	57/56	70/60	61/60	315	61/60	70/70	65/64	319
			117A	7.8/10.4	21.7/25.0	57/56	70/60	61/60	315/315	61/60	70/70	65/64	319/319
			110A	12.0/16.0	33.4/38.5	59/64	70/70	61/60	315/315	64/69	70/70	65/64	319/319
			112A	24.0/32.0	66.7/77.0	101/113	110/125	92/103	315/315	106/117	110/125	97/108	319/319
			112A+117A	31.8/42.4	88.4/102.0	128/144	150/150	117/132	315/315	133/149	150/150	122/136	319/319
			112A+110A	37.6/50.0	104.2/120.3	148/137	150/150	135/153	315/315	152/141	175/175	140/157	319/319
	460—3—60	STD	NONE	—	—	24	30	25	122	25	30	27	124
			116A	13.9	16.7	26	30	25	122	28	30	27	124
			113A	16.5	19.8	30	30	27	122	32	35	29	124
			115A	33.0	39.7	55	60	50	122	57	60	52	124
			114A+116A	41.7	50.2	68	70	62	122	70	70	64	124
			115A+113A	50.0	60.1	65	70	73	122	68	80	76	124
		MED	NONE	—	—	25	30	26	147	27	30	28	149
			116A	13.9	16.7	27	30	26	147	30	30	28	149
			113A	16.5	19.8	31	35	28	147	34	35	30	149
			115A	33.0	39.7	56	60	51	147	58	60	53	149
			114A+116A	41.7	50.2	69	70	63	147	72	80	65	149
			115A+113A	50.0	60.1	67	80	75	147	69	80	77	149
		HIGH	NONE	—	—	26	30	28	152	28	30	30	154
			116A	13.9	16.7	29	30	28	152	32	35	30	154
			113A	16.5	19.8	33	35	30	152	35	35	32	154
			115A	33.0	39.7	58	60	53	152	60	60	55	154
			114A+116A	41.7	50.2	71	80	65	152	73	80	67	154
			115A+113A	50.0	60.1	69	80	76	152	71	80	79	154
	575—3—60	STD	NONE	—	—	19	20	20	97	23	25	24	101
			118A	17.0	20.4	30	30	27	97	35	35	32	101
			119A	34.0	40.9	56	60	51	97	61	70	55	101
			118A+119A	51.0	61.3	66	70	75	97	71	80	79	101
		MED	NONE	—	—	20	25	21	106	24	25	25	110
			118A	17.0	20.4	32	35	29	106	36	40	33	110
			119A	34.0	40.9	57	60	52	106	62	70	57	110
			118A+119A	51.0	61.3	67	80	76	106	72	80	80	110
		HIGH	NONE	—	—	22	25	23	120	26	30	27	124
			118A	17.0	20.4	34	35	31	120	38	40	35	124
			119A	34.0	40.9	59	60	54	120	64	70	59	124
			118A+119A	51.0	61.3	70	80	78	120	74	80	82	124

See: "Legend and Notes for Tables 4 — 11" on page 29.

Table 11—Unit Wire Sizing with Factory Installed 2 Speed Indoor Fan Option — Units Produced Prior To July 30, 2012

Unit RAH	NOM. V—Ph—HZ	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.							
			CRHEATER***A00	Nom (kW)	FLA	NO P.E.				w/ P.E. (pwrdr fr/unit)			
						MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA
120	208/230—3—60	STD	NONE	—	—	50/49	60/60	52/52	279	53/53	60/60	56/56	283
			117A	7.8/10.4	21.7/25.0	50/49	60/60	52/52	279/279	53/53	60/60	56/56	283/283
			110A	12.0/16.0	33.4/38.5	51/57	60/60	52/52	279/279	56/62	60/70	56/56	283/283
			112A	24.0/32.0	66.7/77.0	93/105	100/110	85/96	279/279	97/110	100/110	89/101	283/283
			112A+117A	31.8/42.4	88.4/102.0	120/136	125/150	110/125	279/279	125/141	125/150	114/129	283/283
			112A+110A	37.6/50.0	104.2/120.3	140/129	150/150	128/146	279/279	144/134	150/150	132/151	283/283
		MED	NONE	—	—	53/52	60/60	56/55	329	57/56	70/60	60/59	333
			117A	7.8/10.4	21.7/25.0	53/52	60/60	56/55	329/329	57/56	70/60	60/59	333/333
			110A	12.0/16.0	33.4/38.5	56/61	60/70	56/56	329/329	60/66	70/70	60/60	333/333
			112A	24.0/32.0	66.7/77.0	97/109	100/110	89/100	329/329	102/114	110/125	93/104	333/333
			112A+117A	31.8/42.4	88.4/102.0	124/140	125/150	114/129	329/329	129/145	150/150	118/133	333/333
			112A+110A	37.6/50.0	104.2/120.3	144/133	150/150	132/150	329/329	149/138	150/150	137/154	333/333
		HIGH	NONE	—	—	56/55	60/60	59/58	340	60/59	70/70	64/63	344
			117A	7.8/10.4	21.7/25.0	56/55	60/60	59/58	340/340	60/59	70/70	64/63	344/344
			110A	12.0/16.0	33.4/38.5	59/64	60/70	59/59	340/340	64/69	70/70	64/63	344/344
			112A	24.0/32.0	66.7/77.0	101/113	110/125	92/103	340/340	106/117	110/125	97/108	344/344
			112A+117A	31.8/42.4	88.4/102.0	128/144	150/150	117/132	340/340	133/149	150/150	122/136	344/344
			112A+110A	37.6/50.0	104.2/120.3	148/137	150/150	135/153	340/340	152/141	175/175	140/157	344/344
	460—3—60	STD	NONE	—	—	25	30	26	134	26	30	28	136
			116A	13.9	16.7	26	30	26	134	28	30	28	136
			113A	16.5	19.8	30	30	27	134	32	35	29	136
			115A	33.0	39.7	55	60	50	134	57	60	52	136
			114A+116A	41.7	50.2	68	70	62	134	70	70	64	136
			115A+113A	50.0	60.1	65	70	73	134	68	80	76	136
		MED	NONE	—	—	26	30	27	159	28	30	29	161
			116A	13.9	16.7	27	30	27	159	30	30	29	161
			113A	16.5	19.8	31	35	28	159	34	35	30	161
			115A	33.0	39.7	56	60	51	159	58	60	53	161
			114A+116A	41.7	50.2	69	70	63	159	72	80	65	161
			115A+113A	50.0	60.1	67	80	75	159	69	80	77	161
		HIGH	NONE	—	—	27	30	29	164	29	35	31	166
			116A	13.9	16.7	29	30	29	164	32	35	31	166
			113A	16.5	19.8	33	35	30	164	35	35	32	166
			115A	33.0	39.7	58	60	53	164	60	60	55	166
			114A+116A	41.7	50.2	71	80	65	164	73	80	67	166
			115A+113A	50.0	60.1	69	80	76	164	71	80	79	166
	575—3—60	STD	NONE	—	—	19	25	20	107	23	25	24	111
			118A	17.0	20.4	30	30	27	107	35	35	32	111
			119A	34.0	40.9	56	60	51	107	61	70	55	111
			118A+119A	51.0	61.3	66	70	75	107	71	80	79	111
		MED	NONE	—	—	20	25	21	116	24	30	26	120
			118A	17.0	20.4	32	35	29	116	36	40	33	120
			119A	34.0	40.9	57	60	52	116	62	70	57	120
			118A+119A	51.0	61.3	67	80	76	116	72	80	80	120
		HIGH	NONE	—	—	22	25	23	130	26	30	27	134
			118A	17.0	20.4	34	35	31	130	38	40	35	134
			119A	34.0	40.9	59	60	54	130	64	70	59	134
			118A+119A	51.0	61.3	70	80	78	130	74	80	82	134

See: "Legend and Notes for Tables 4 — 11" on page 29.

Legend and Notes for Tables 4 – 11

LEGEND:

- BRKR – Circuit breaker
- CO – Convenient outlet
- DISC – Disconnect
- FLA – Full load amps
- LRA – Locked rotor amps
- MCA – Minimum circuit amps
- MOCB – MAX FUSE or HACR Breaker
- PE – Power exhaust
- PWRD CO – Powered convenient outlet
- UNPWR CO – Unpowered convenient outlet

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

% Voltage Imbalance = 100 x $\frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$

Example: Supply voltage is 230-3-60



- AB = 224 v
- BC = 231 v
- AC = 226 v

Average Voltage = $\frac{(224 + 231 + 226)}{3} = \frac{681}{3}$

= 227

Determine maximum deviation from average voltage.

- (AB) 227 – 224 = 3 v
- (BC) 231 – 227 = 4 v
- (AC) 227 – 226 = 1 v

Maximum deviation is 4 v.

Determine percent of voltage imbalance.

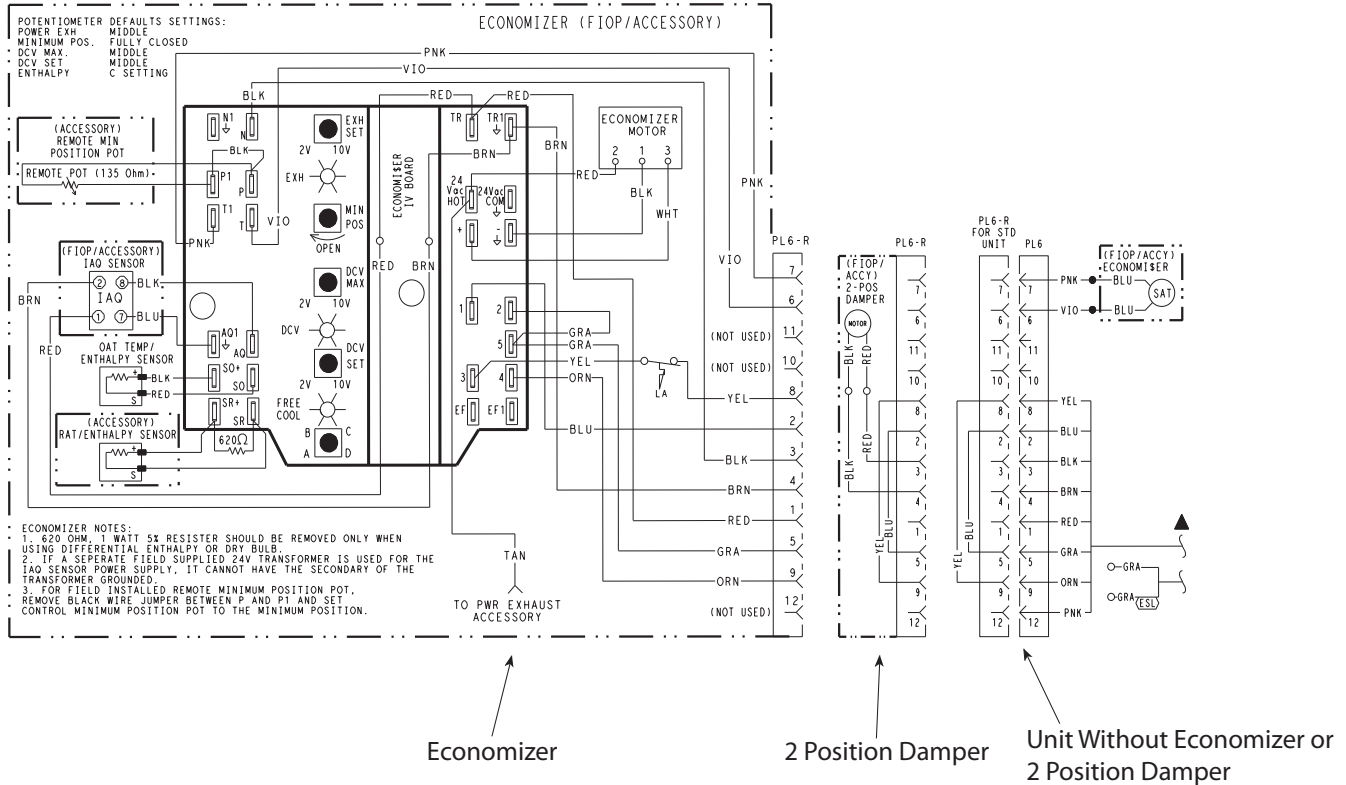
% Voltage Imbalance = 100 x $\frac{4}{227}$

= 1.76%

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

FIGURE 32 Wiring for Optional Economizer



Step 11 — Adjust Factory-Installed Options

Smoke Detector —

Smoke detector will be connected at the Controls Connections Board, at terminals marked “Smoke Shutdown”. Remove jumper JMP 3 when ready to energize unit.

Economizer Occupancy Switch —

Refer to Fig. 32 for general Economizer wiring. External occupancy control is managed through a connection on the Controls Connections Board.

If external occupancy control is desired, connect a time clock or remotely controlled switch (closed for Occupied, open for Unoccupied sequence) at terminals marked OCCUPANCY. Remove or cut jumper JMP 2 to complete the installation.

Step 12 — Install Accessories, As Required

Available accessories include:

- Roof Curb
- Thru-base connection kit (must be installed before unit is set on curb)
- Manual outside air damper
- Two-Position motorized outside air damper
- Economizer (with control)
- Barometric relief
- Power exhaust
- Electric Heaters
- Single Point Kits
- Differential dry-bulb sensor (Economizer IV)
- Outdoor enthalpy sensor
- Smoke detector (Supply Air)
- Hail guards
- Phase monitor control
- Winter start kit

Refer to separate installation instructions for information on installing these accessories.

START-UP CHECKLIST

(Remove and Store in Job File)

I. PRELIMINARY INFORMATION

MODEL NO.: _____

SERIAL NO.: _____

DATE: _____

TECHNICIAN: _____

II. PRE-START-UP (insert checkmark in box as each item is completed)

- ☐ VERIFY THAT JOBSITE VOLTAGE AGREES WITH VOLTAGE LISTED ON RATING PLATE
- ☐ VERIFY THAT ALL PACKAGING MATERIALS HAVE BEEN REMOVED FROM UNIT
- ☐ REMOVE ALL SHIPPING HOLD DOWN BOLTS AND BRACKETS PER INSTALLATION INSTRUCTIONS
- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTALLATION INSTRUCTIONS
- ☐ CHECK REFRIGERANT PIPING FOR INDICATIONS OF LEAKS; INVESTIGATE AND REPAIR IF NECESSARY
- ☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS
- ☐ CHECK THAT RETURN (INDOOR) AIR FILTERS ARE CLEAN AND IN PLACE
- ☐ VERIFY THAT UNIT INSTALLATION IS LEVEL
- ☐ CHECK FAN WHEELS AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS
- ☐ CHECK TO ENSURE THAT ELECTRICAL WIRING IS NOT IN CONTACT WITH REFRIGERANT LINES OR SHARP METAL EDGES
- ☐ CHECK PULLEY ALIGNMENT AND BELT TENSION PER INSTALLATION INSTRUCTIONS

III. START-UP (REFER TO UNIT SERVICE/MAINTENANCE MANUAL FOR START-UP INSTRUCTIONS)

ELECTRICAL

SUPPLY VOLTAGE	L1-L2	_____	L2-L3	_____	L3-L1	_____
CIRCUIT 1 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
CIRCUIT 2 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
INDOOR-FAN AMPS		_____		_____		_____
OUTDOOR-FAN AMPS	NO. 1	_____	NO. 2	_____		_____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE	_____ DB	_____ WB
RETURN-AIR TEMPERATURE	_____ DB	_____ WB
COOLING SUPPLY AIR	_____ DB	_____ WB

PRESSURES (Cooling Mode)

REFRIGERANT SUCTION, CIRCUIT 1	_____ PSIG	_____ F
REFRIGERANT SUCTION, CIRCUIT 2	_____ PSIG	_____ F
REFRIGERANT DISCHARGE, CIRCUIT 1	_____ PSIG	_____ F
REFRIGERANT DISCHARGE, CIRCUIT 2	_____ PSIG	_____ F

- ☐ VERIFY THAT 3-PHASE FAN MOTOR AND BLOWER ARE ROTATING IN CORRECT DIRECTION.
- ☐ VERIFY THAT 3-PHASE SCROLL COMPRESSOR IS ROTATING IN THE CORRECT DIRECTION
- ☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS

GENERAL

- ☐ SET ECONOMIZER MINIMUM VENT AND CHANGEOVER SETTINGS TO MATCH JOB REQUIREMENTS (IF EQUIPPED)